

RADIO CASSETTE RECORDER WITH COMPACT DISC PLAYER



SPECIFICATION

GENERAL

Frequency Response	: 20 ~ 20000Hz
Speakers	: ø 102mm x 2
Power Sources	: AC: See rating label DC: 9V (D, UM1, HP2 x 6)
Output Power	: 2.0W x 2
Power Consumption	: 12W
Dimension	: 468(W) x 190(D) x 180(H)
Weight	: 3.5Kg
Headphone Jack	: ø 3.5mm (Stereo)

TAPE

Frequency Response	: 63Hz ~ 12.5KHz
Signal to Noise Ratio	
Playback	: 45 dB
Record/Playback	: 35 dB
Separation	: 33 dB
Total Harmonic Distortion	
Playback	: 2%
Record/Playback	: 3%
Erasing Effect	: 65 dB

RADIO

Frequency range	: FM : 88-108MHz AM(MW): 530 – 1605KHz 530-1720KHz (USA BAND) LW: 150 – 285KHz SW: 6 – 18MHz
I.F	: FM: 10.7MHz SW/AM(MW)/LW: 455 or 465KHz
Antenna	: FM/SW: Telescopic rod antenna AM(MW)/LW: Ferrite bar antenna

COMPACT DISC PLAYER

Frequency Range	: 20 ~ 20000Hz
Dynamic Range	: 83 dB (1KHz with filter)
Signal to Noise Ratio	: 82 dB (1KHz)
Channel Separation	: 70 dB (1KHz with LPF for 30KHz)
D/A Conversion	: 16 bits

CONTENTS

■ SAFETY PRECAUTION	2
■ SERVICING NOTE	3
■ LOCATION OF CONTROLS	4
■ DISASSEMBLY INSTRUCTION	6
■ DESCRIPTION OF LCD SEGMENTS	8
■ BASIC CIRCUIT OPERATION	9
■ TROUBLESHOOTING	12
■ ADJUSTMENT	
1. TUNER SECTION	17
2. TAPE SECTION	22
3. CD SECTION	23
■ BLOCK DIAGRAM	28
■ SCHEMATIC DIAGRAM	30
■ PCB PATTERN & MARKING DIAGRAM	32
■ WIRING DIAGRAM	34
■ IC & TR INTERNAL DIAGRAM	36
■ EXPLODED VIEW	
1. CD DECK	39
2. MAIN SET (RCD-980)	40
3. CASSETTE DECK	42
■ PARTS LIST	44
■ ABBREVIATION LIST	47

— OPTION —

UL/CSA : American (UL)/Canadian (CSA) model
FTZ : Germany model
BS : UK model

AUS : Australian model
LW : LW band equipped unit
SW : SW band equipped unit

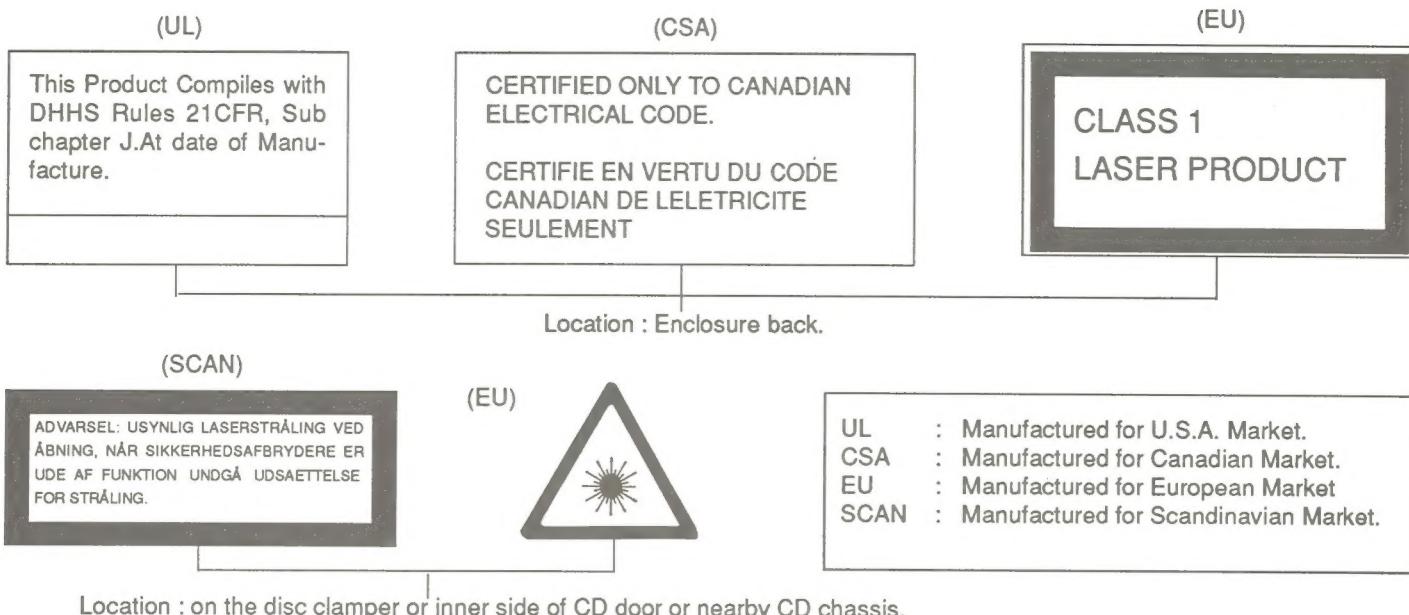
■ SAFETY PRECAUTION

1. CLASS 1 LASER PRODUCT

This compact disc player is classified as a CLASS 1 laser product.

2. LASER WARNING LABEL

The label shown below may be affixed or not according to country.



3. LASER BEAM WARNING

ADVERSEL — USYNLIG LASERSTRÅLING VED ÅBNING, NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION. UNDGÅ UDSAETTELSE FOR STRÅLING.

VARNING — OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRR ÄR URKOPPLAD. STRALEN ÄR FARLIG.

VARITUS — LAITE SISÄLTÄÄ LASERDIODIN, JOKA LÄHETTÄÄ NÄKYMÄTÖNTÄ SILMILLE VAARALLISTA LASERSATEILYÄ.

CAUTION — INVISIBLE LASER RADIATION WHEN OPEN AND INTERLOCKS DEFEATED. AVOID EXPOSURE TO BEAM.

4. LASER DIODE SPECIFICATION (OPTICAL PICK-UP)

- Material: AlGaAs
- Wavelength: 760-800nm
- Emission duration: Continuous
- Laser Output: 0.2mW
- * This output is the value measured at distance 1.6mm from the objective lens surface on the optical pick-up block.
- Classification: CLASS 1

5. WARNING FOR SERVICING

WARNING: When servicing, do not approach the LASER exit with the eye too closely. In case it is necessary to confirm LASER beam emission, be sure to observe from a distance of more than 30cm from the surface of the objective lens on the optical pick-up block.

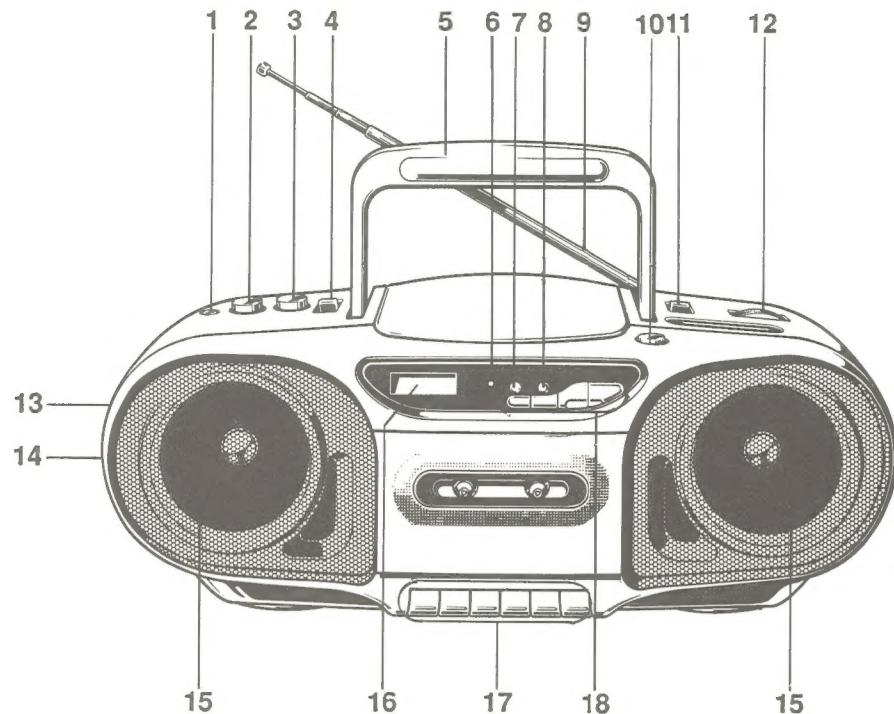
VARNING: När underhållningsarbeten utförs, närra dig försiktigt och se inte på laserutstrålningen på för nära håll. Ifall det är nödvändigt att betrygga laserstrålens utströmning. Var säker att kontrollera detta från ett avstånd av mer än 30cm (11.81 inch.) från den objektiva linsens yta på den optiska utsändningspunkten.

ADVARSEL: När repareringsarbejdet udføres, nærm dig forsigtigt og se ikke på laserudstrålingen på for nære hånd. It ilfaeldet at det er nødvændigt at bestemme laserstrålens udstråling. Vaer sikker på kontrollere dette fra en afstand af mere end 30cm (11.81 inch.) fra den objektive lenses overflade på den optiske udsendningspunkt.

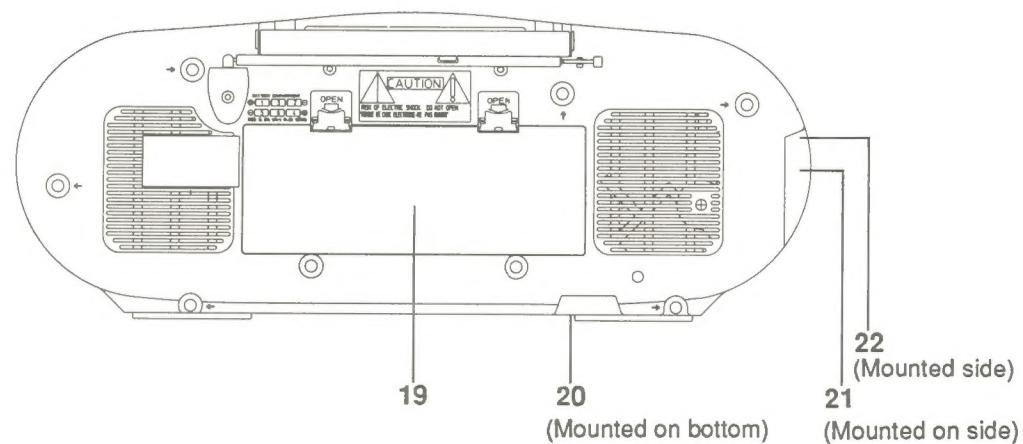
VAROITUS: Silmiä on varottava viemästä liian läheille Laser-poistokanavaa huolion aikana. Jos on välttämätöntä varmistaa Laser-Säteen päästö, pysytteksit tarkasteltaessa vähintään 30cm etäyydellä optisen lukon objektiivilinssin pinnasta.

■ LOCATION OF CONTROLS

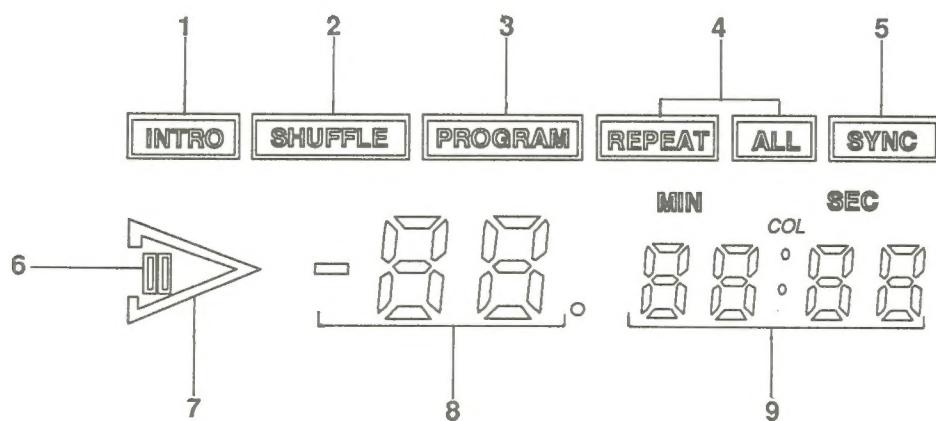
[FRONT]



[REAR]



[CD OPERATION LCD]



■ SERVICING NOTE

1. Disconnect power supply cord before separating cabinet for servicing as you may experience an electric shock.
2. Avoid repairing under direct sunshine and heat which may cause cabinet, transistor and IC to be transformed or misoperate.
3. Use a soft cotton swab moistened with warm water or neutral cleaner when parts of a unit need to be cleaned.
4. When replacing parts with safety features built in, be sure to use specified parts with same specifications only.
5. Avoid repairing the set near a TV or any other magnetic forces.
6. Disconnect the plug from wall socket during electric storm to reduce the risk of damage.
7. Be careful of electrostatic damage when replacing the control IC such as μ -COM, LSI and pick-up.
8. Be sure not to separate the pick-up from the unit and not to touch the ALPC (Automatic Laser Power Control) circuit.

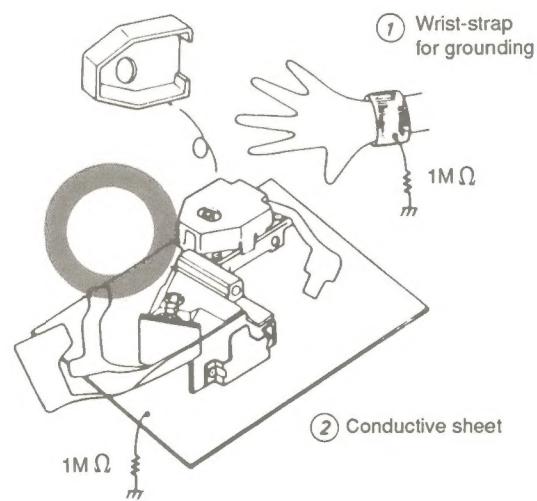
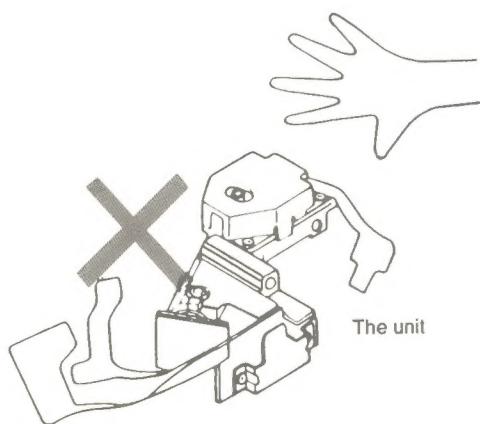
HANDLING THE OPTICAL PICK-UP

* The laser diode in the optical pick up may suffer electrostatic breakdown because of potential static electricity from clothing and your body.

The following method is recommended.

1. Place a conductive sheet on the workbench. (The black sheet used as wrapping for repair parts.)
2. Place the set on the conductive sheet so that the chassis is grounded to the sheet.
3. Place your hands on the conductive sheet. (This gives them the same ground as the sheet.)
4. Remove the optical pick up block.
5. Perform work on top of the conductive sheet.
Be careful not to let your clothes or any other static sources touch the unit.

* Be sure to put on a wrist-strap grounded to the sheet.
* Be sure to lay a conductive sheet made of copper etc. which is grounded to the table.



[FRONT]

1. PHONES jack
2. VOLUME control (with LOUDNESS)
3. TONE control
4. FUNCTION selector
(TAPE • RADIO OFF/RADIO/CD)
5. Handle
6. POWER indicator
7. MODE (CD)
8. PROGRAM (CD)
9. FM rod antenna
10. CD OPEN button
11. BAND selector
12. TUNING knob
13. FM MODE/BEAT-CUT selector
14. AC IN~ (Mounted on side)
15. Speakers
16. CD operation LCD

17. Deck operation buttons

- RECord button
- PLAY button
- ◀ REW button
- F.FWD button
- ▲ STOP/EJECT button
- PAUSE button

18. CD operation buttons

- SKIP & SEARCH button
- STOP button (CD)
- PLAY/PAUSE button (CD)

[REAR]

19. Battery [BOTTOM] compartment
20. Voltage selector (optional : Mounted on bottom)
21. AC IN ~ (Mounted on side)
22. FM-MODE/BEAT-CUT Selector

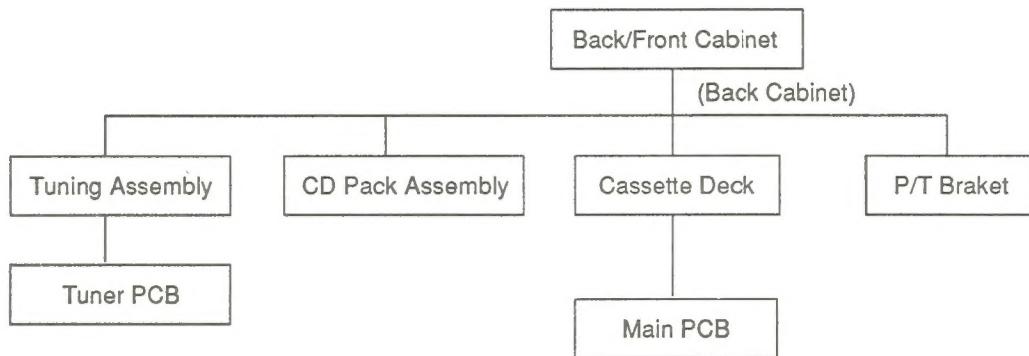
[CD OPERATION LCD]

1. INTRO indicator (Scanning all tracks for 10 seconds successively.)
2. SHUFFLE indicator (Tracks are played in a random order.)
3. PROGRAM indicator (Up to a maximum of 16 tracks to be programmed.)
4. REPEAT, ALL indicator (A selected sequence or tracks are played repeatedly.)
5. SYNC indicator (Recording starts from the beginning of the disc.)
6. Pause indicator
7. Play indicator
8. Track number indicator
9. Time indicator

■ DISASSEMBLY INSTRUCTION

* Before disassembling the unit, remove batteries or AC power cord.

1. DISASSEMBLY PROCEDURE OUTLINE



2. DISASSEMBLY PROCEDURE

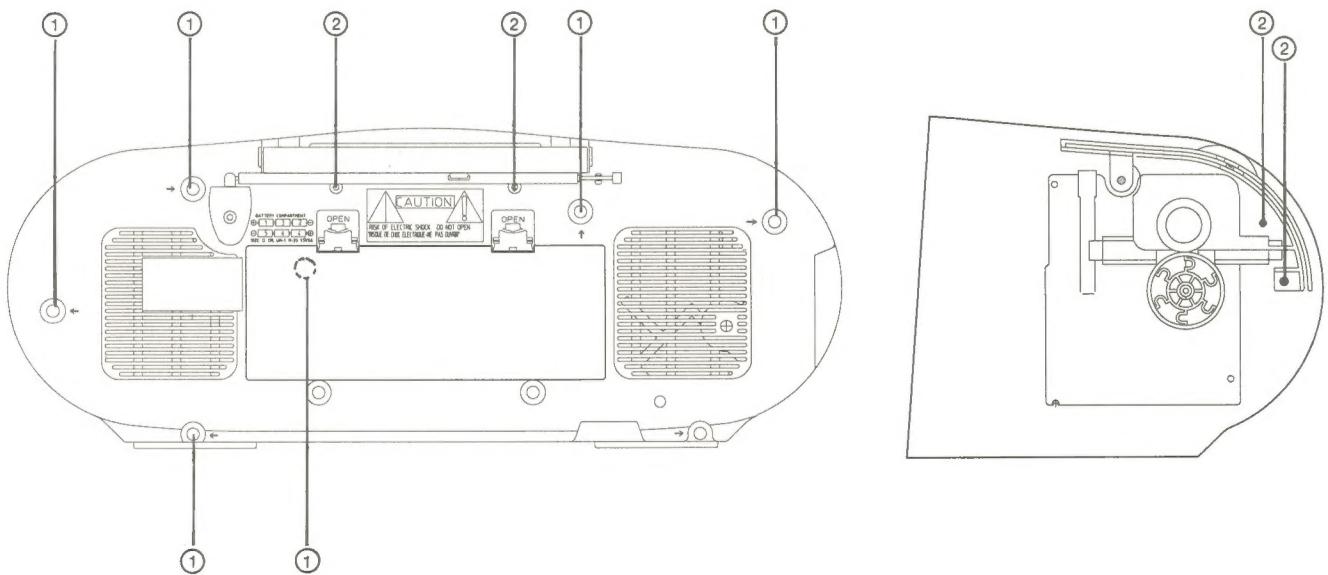
* Disassemble the unit in the order given below.

1) FRONT/BACK CABINET

- (1) Release 7 screws (①).
- (2) Disconnect connecting wires.
- (3) Separate Front and Back Cabinet.

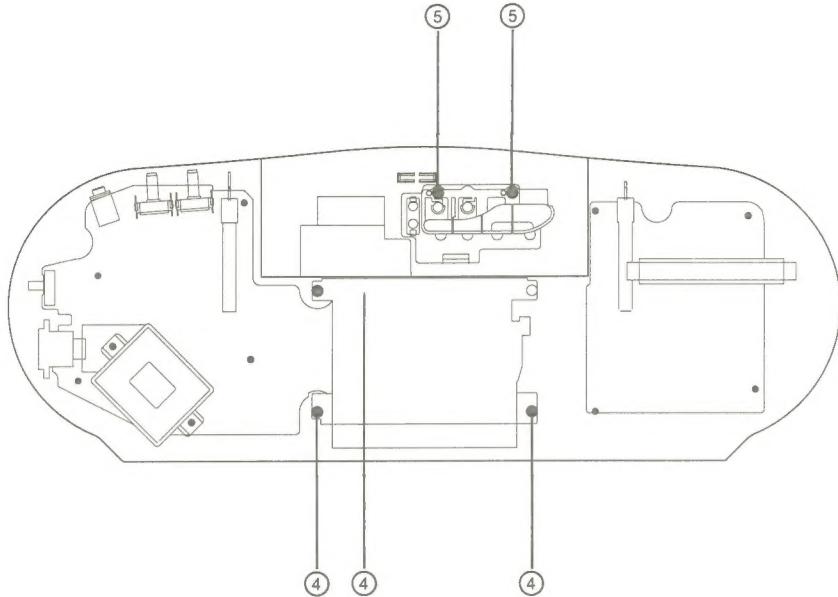
2) TUNING ASSEMBLY

- (1) Release 2 screws (②).
- (2) Remove Tuning Assembly.



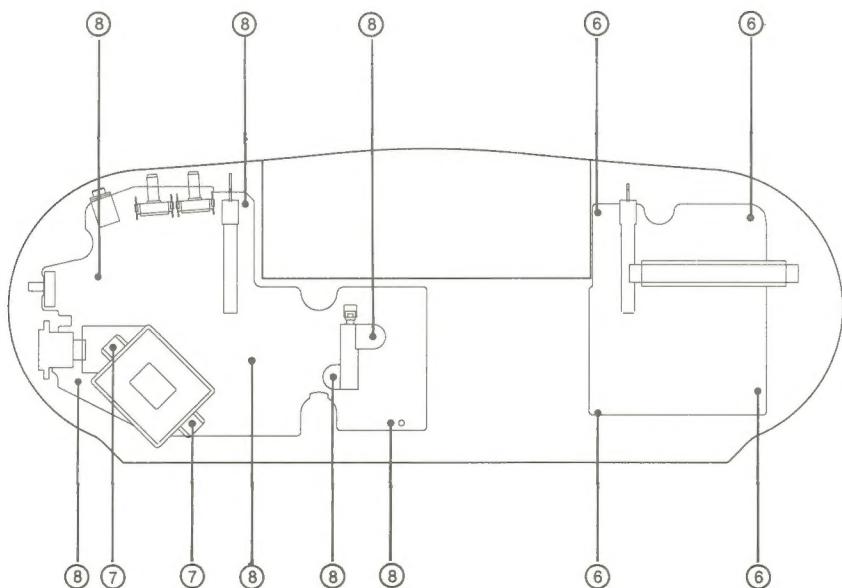
3) CD PACK ASSEMBLY & CASSETTE DECK

- (1) Release 2 screws (③ : page 6).
- (2) Remove CD pack assembly.
- (3) Release 4 screws (④).
- (4) Disconnect connecting wires.
- (5) Release 3 screws. (⑤).
- (6) Remove CD control Knob.
- (7) Remove cassette deck.



4) TUNER PCB & MAIN PCB

- (1) Release 4 screws (⑥)
- (2) Remove Tuner PCB.
- (3) Release 2 screws (⑦).
- (4) Release 5 screws (⑧).
- (5) Remove Main PCB.

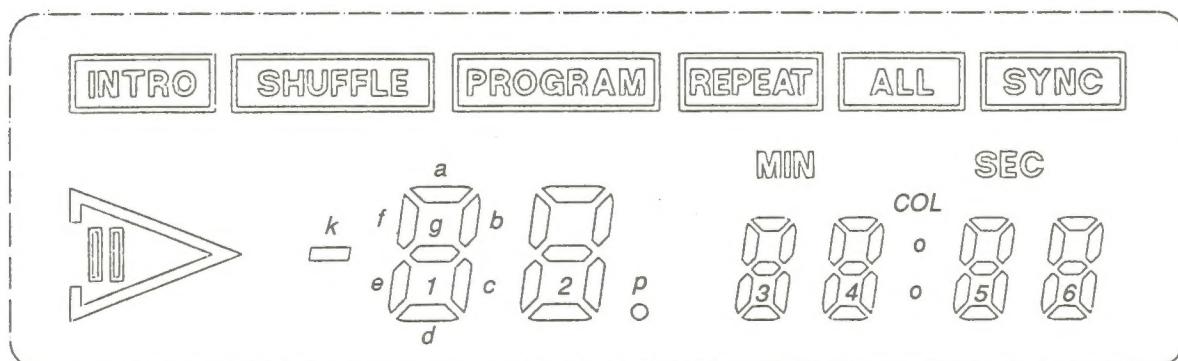


■ DESCRIPTION OF LCD SEGMENTS

If one or all of the LCD Segments (see segment diagram below) don't work, check if IC7530 and LCD pins are properly connected referring to the chart below.

No	1	2	3	4	5	6	7	8	9	10	11	12	13	14
COM1	COM1			INTRO	K	1a		SHUFFLE	2a	P	PROGRAM	3a	MIN	REPEAT
COM2		COM2		▶	1f	1g	1b	2f	2g	2b	3f	3g	3b	4f
COM3			COM3		1e	1d	1c	2e	2d	2c	3e	3d	3c	4e

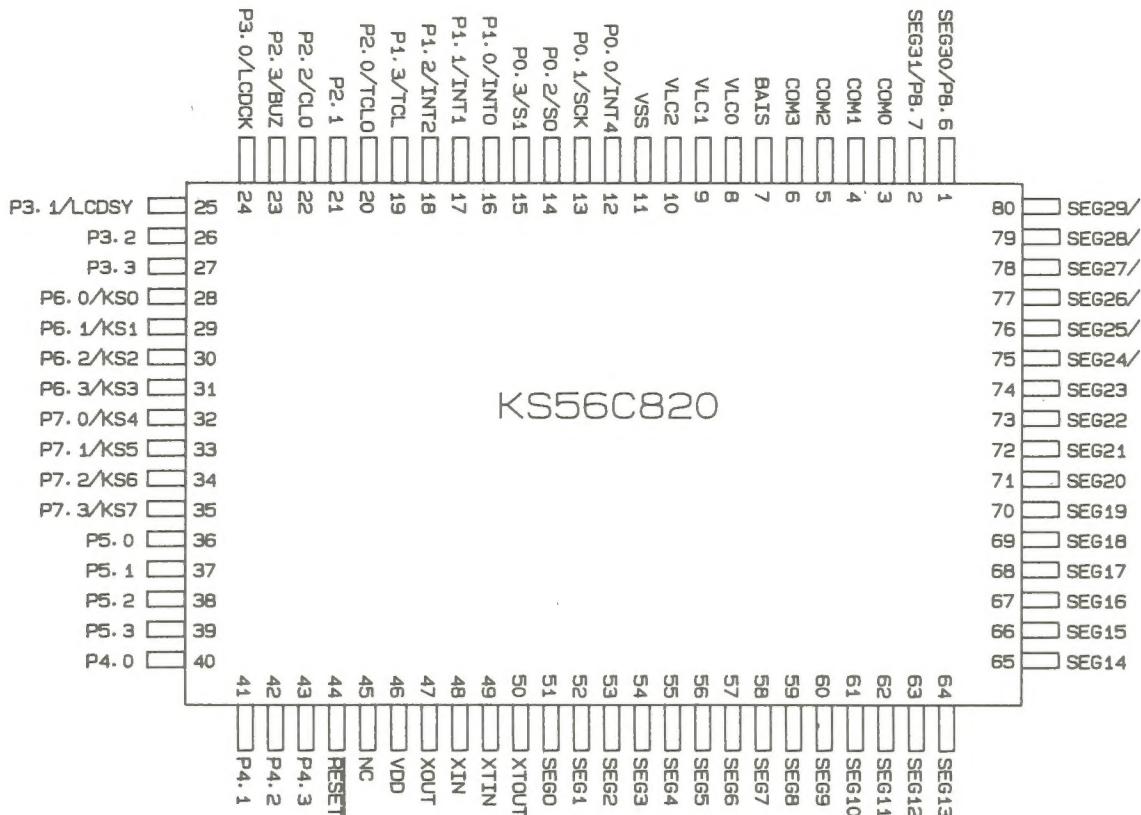
No	15	16	17	18	19	20	21	22
COM1	4a	COL	ALL	5a	SEC	SYNC	6a	
COM2	4g	4b	5f	5g	5b	6f	6g	6b
COM3	4d	4c	5e	5d	5c	6e	6d	6c



■ BASIC CIRCUIT OPERATION

1. MICOM PIN DESCRIPTION

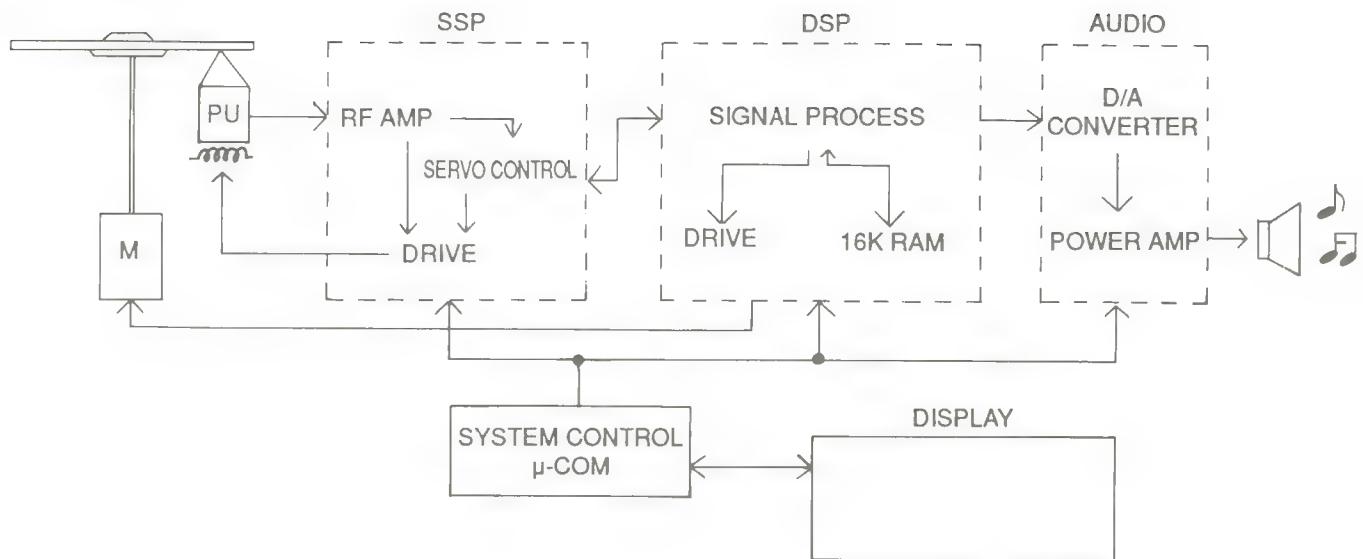
- KS56C820 (MICOM) : IC7530



Pin Name	Pin Description
P1.0-P1.3	4-bit Input
P2, P7	4-bit Input/Output
P3, P6	I/O mode selectable in 1-bit unit by software
P4, P5	4-bit input/output, N-ch open drain
P8.0-P8.7	Outputs in 1-bit unit (shared with segment outputs)
SEG0-SEG23	Segment output for LCD display
SEG24-SEG31	Segment output for LCD display (shared with Port 8)
COM0-COM3	Common signal output for LCD display
VLC0-VLC2	LCD power supply pin
BIAS	LCD power supply control pin for 3/5V operating
LCDCK	LCD clock output for display expansion
LCDSY	LCD sync. clock output for display expansion
TCL	Timer/Counter external clock input
TCLO	Timer/Counter clock output
INT0, 1, 2, 4	External interrupt input
CLO	Clock output
BUZ	2KHz clock output for buzzer
KS0-KS7	Semi-interrupt input detecting external falling edge
SCK, SI, SO	SCK: serial clock, SI: serial input, SO: serial output
XIN, XOUT	Crystal/Ceramic or RC clock I/O for Main-system clock
XTIN1 XTOUT	Crystal clock I/O pins for sub-system clock

2. CD BASIC CIRCUIT OPERATION

1) CD BLOCK DIAGRAM



2) OPTICAL PICK UP UNIT

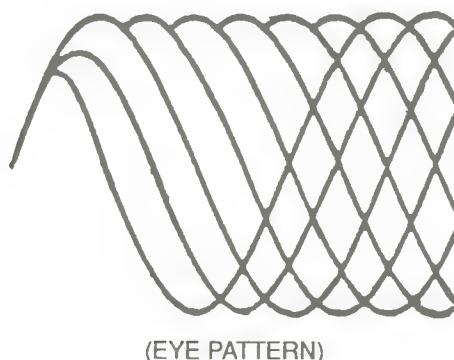
CD system use laser beam to detect the signals recorded onto the discs.

The pick up detects the presence or absence of data pits on the disc surface, emitting laser beam capable of being incorporated into the pick up and converting signals from the disc into electrical signals.

3) RF AMPLIFIER

After the optical pick up detects the presence or absence of data pits on the disc surface the resulting signals referred to as RF or Eye pattern are not apparent and quite similar to the sine waveform.

The signal waveform varies depending on the length and width of each pit on a disc surface. The RF signals can hardly be seen on screen. The eyepattern are first amplified by the RF amplifier, and then demodulated by using the EFM code (Eight to Fourteen Modulation → 8 bits → 14 bit modulation).



4) FOCUS AND TRACKING SERVO

(1) FOCUSING SERVO: It vertically shifts the objective lens so that the beam correctly fall on the disc surface to read out the data recorded on the disc.

(2) TRACKING SERVO: It controls the objective lens to maintain proper tracking.

- ① Normal Tracking Servo : It shifts the objective lens for proper tracking (1.6 μm).
- ② Feed Servo : It shifts the optical pick up itself for tracking.

5) DSP (Digital Signal Processor)

DSP (Digital Signal Processor) is basically composed of the EFM (Eight to Fourteen Modulation) decoder and Error Correction System.

The EFM decoder converts the serial 14 bit EFM code to an 8 bit parallel code which is directed to a bi-directional bus and placed in the RAM. The contents of the RAM are read by the Error Detection Circuit. The Error Detection Circuit extracts the interleaved data samples so that the signal is deinterleaved and detects most of the errors present in the signal due to flaws on the disc.

The decoded signal, with error correction, is output from the Memory Control circuit in a 16 bit serial code and directed to the D/A Converter. The Memory Control circuit also outputs a signal, derived from the Clock, which denotes the linear velocity of the disc. These signals are directed to the CLV (Constant Linear Velocity) circuit to correct any error in the disc speed.

6) D/A CONVERTER

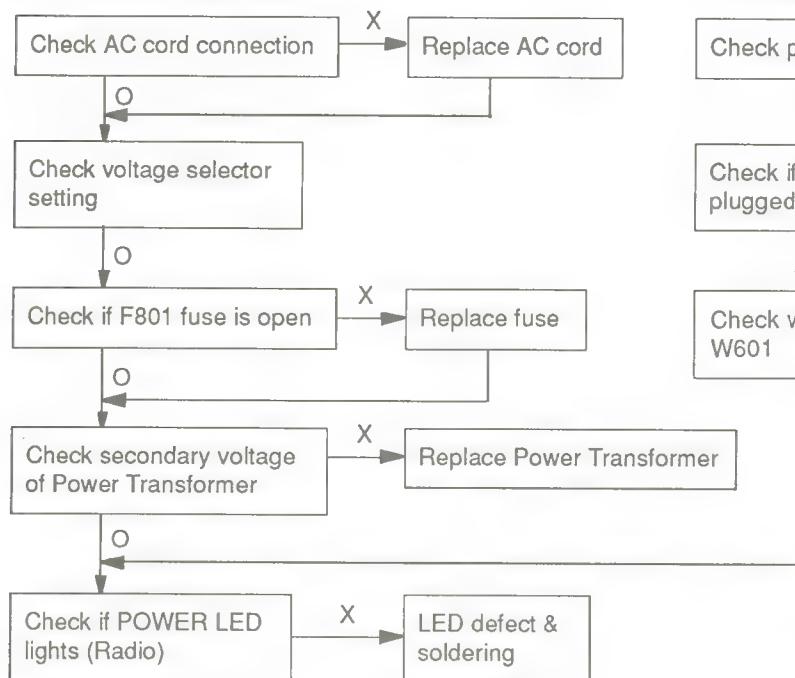
The signal output from the Memory Control in the Error Correction circuit is a serial 16 Bit NRZ (Non-Return to Zero), error corrected and de-interleaved digital code. The signal must now be converted to an analog signal suitable for application to a stereo pre-amplifier. This is the function of the D/A (Digital to Analog) Converter and Analog Amplifier.

TROUBLESHOOTING GUIDE

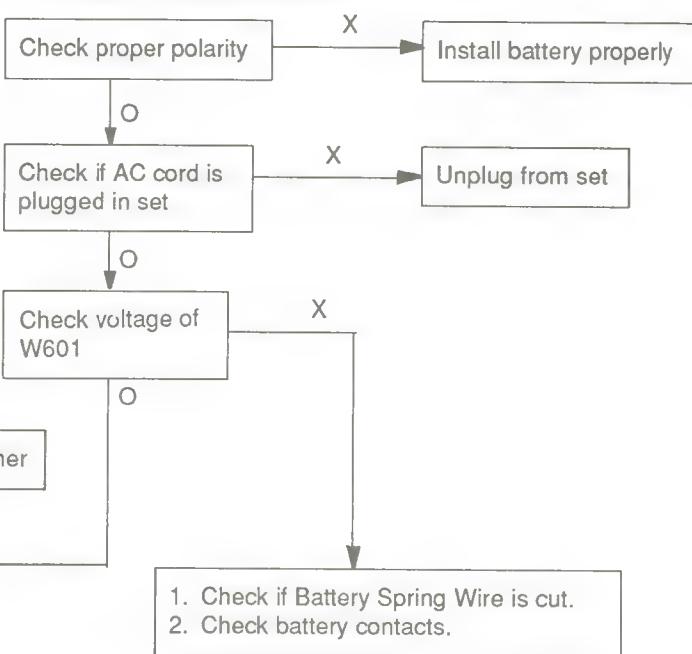
1. RADIO CASSETTE SECTION

* O : YES. NORMAL. OK
X : NO. ABNORMAL

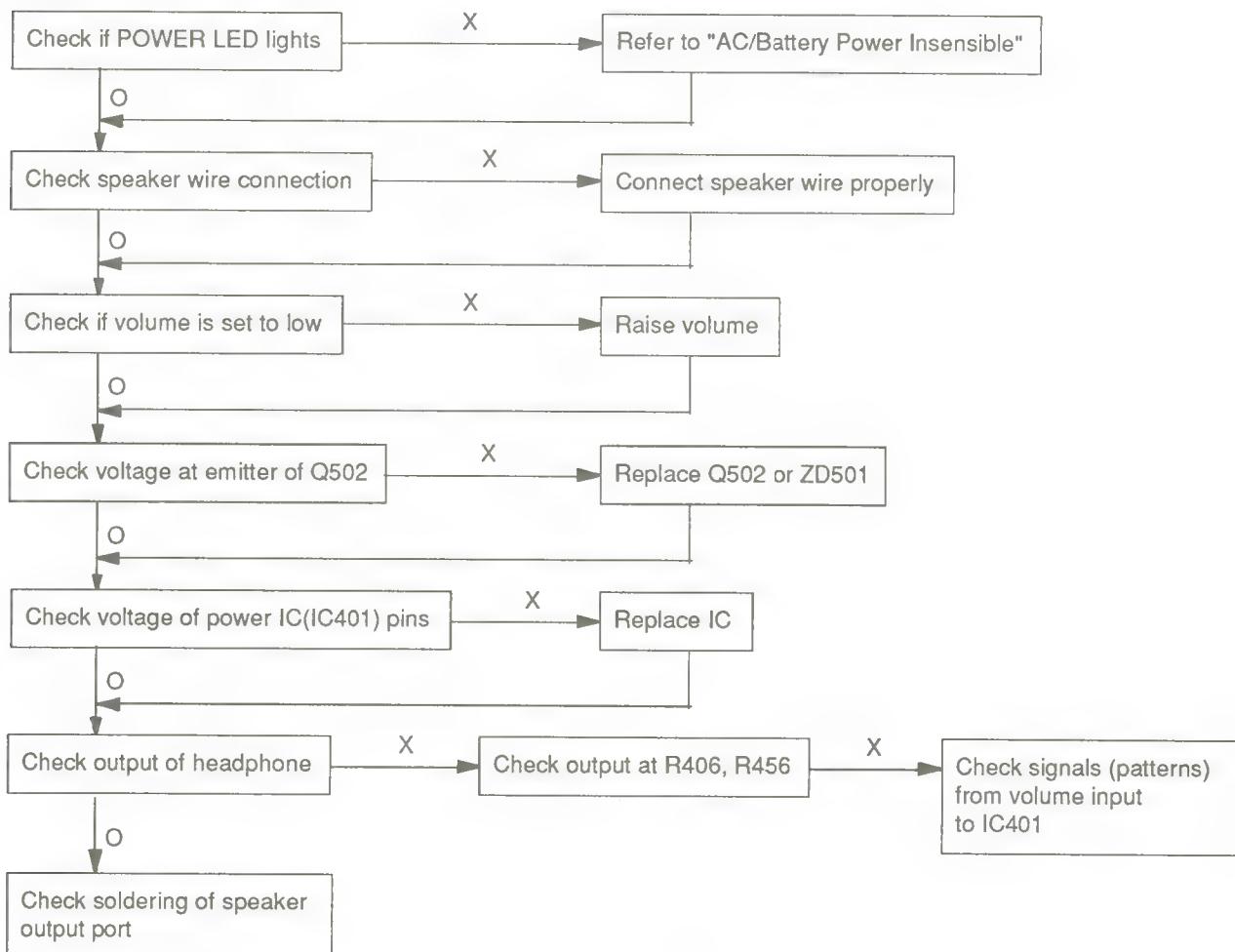
1) AC Power Insensible



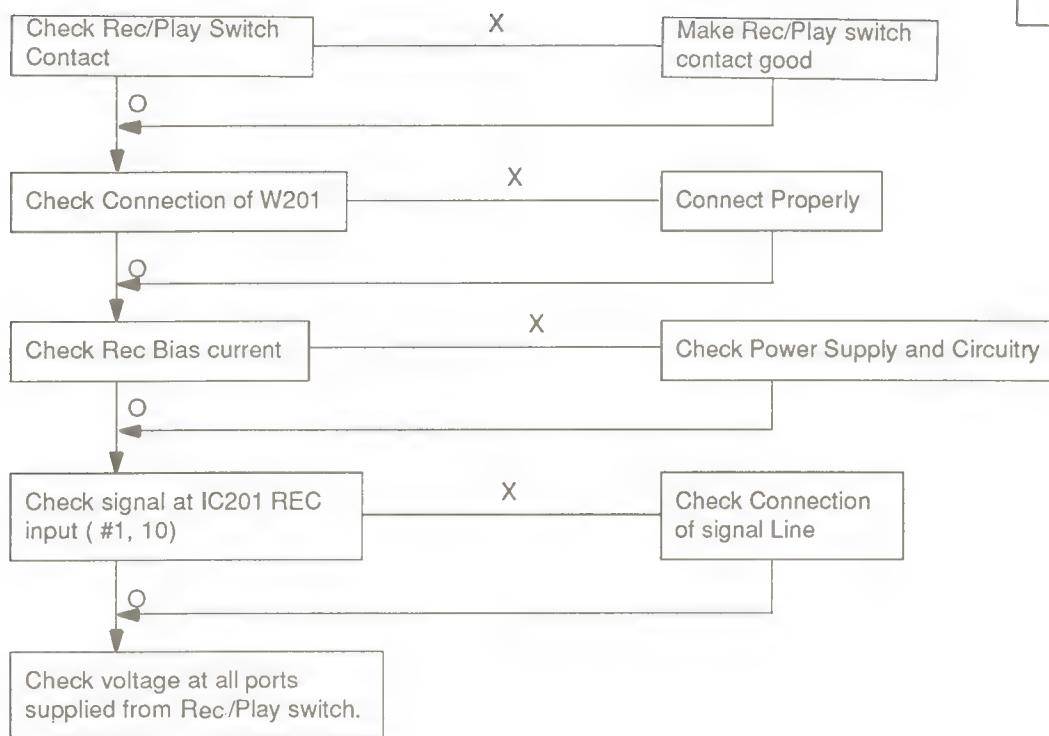
2) Battery Power Insensible



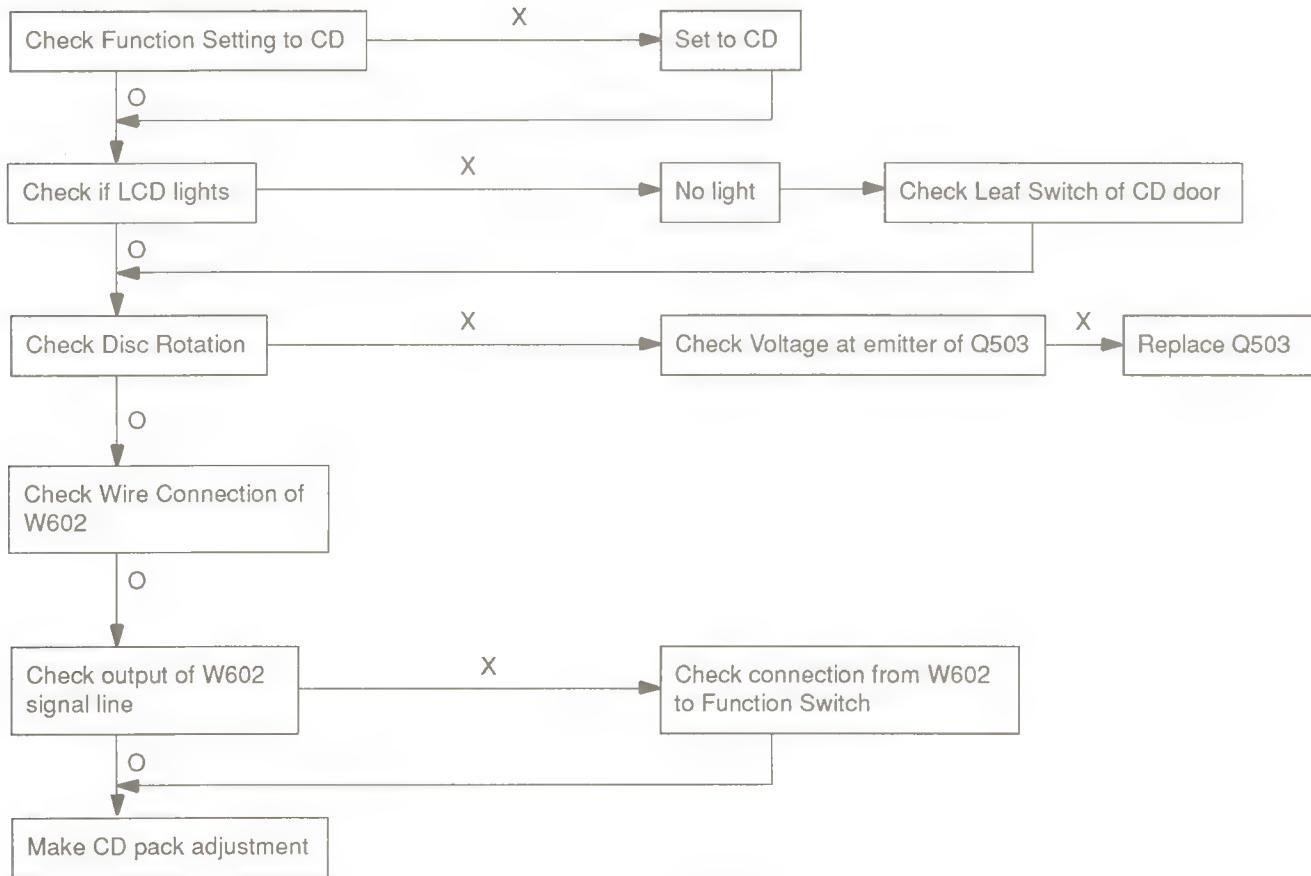
3) No Output



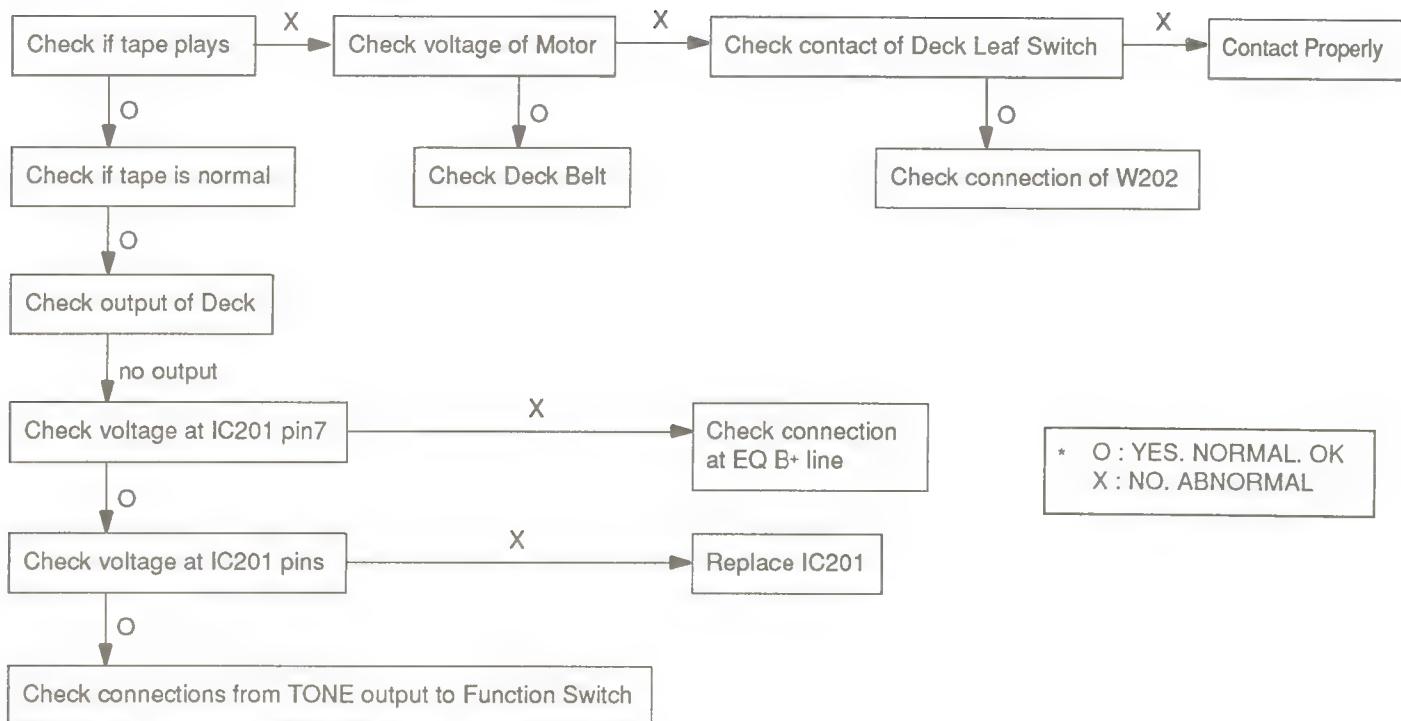
4) Record Not Working



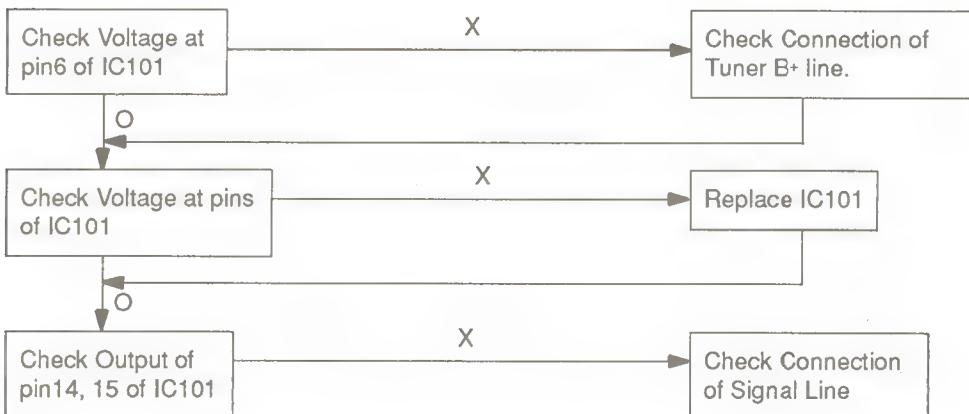
5) Compact Disc Inoperative



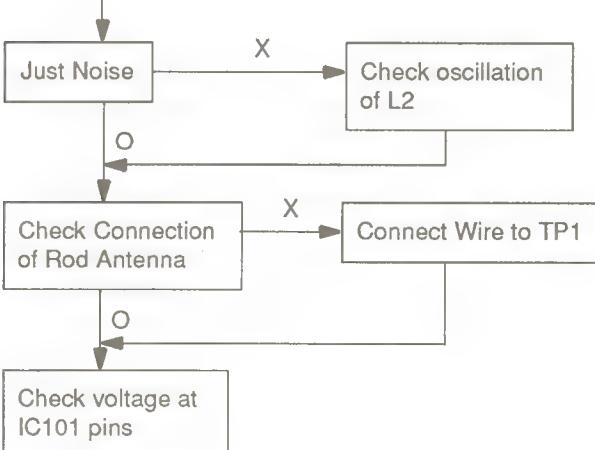
6) Tape Not Working



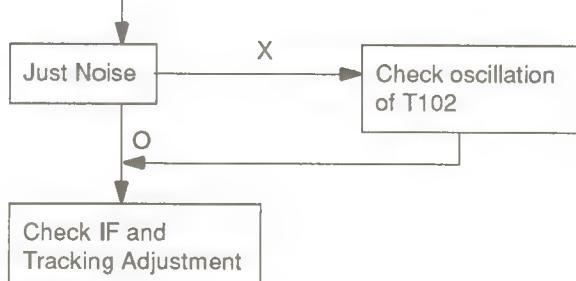
7) Radio Insensible



FM INSENSIBLE

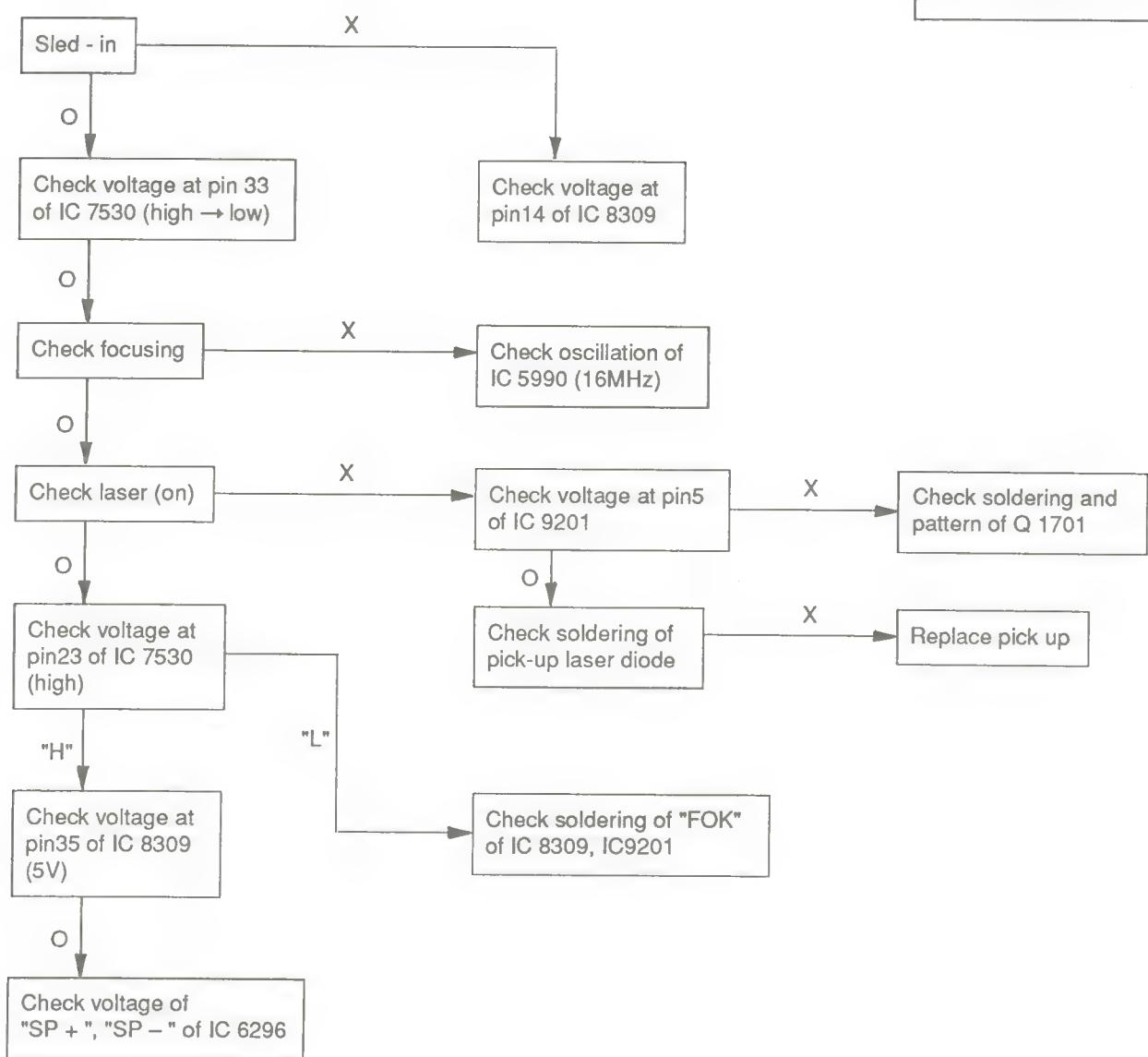


AM INSENSIBLE

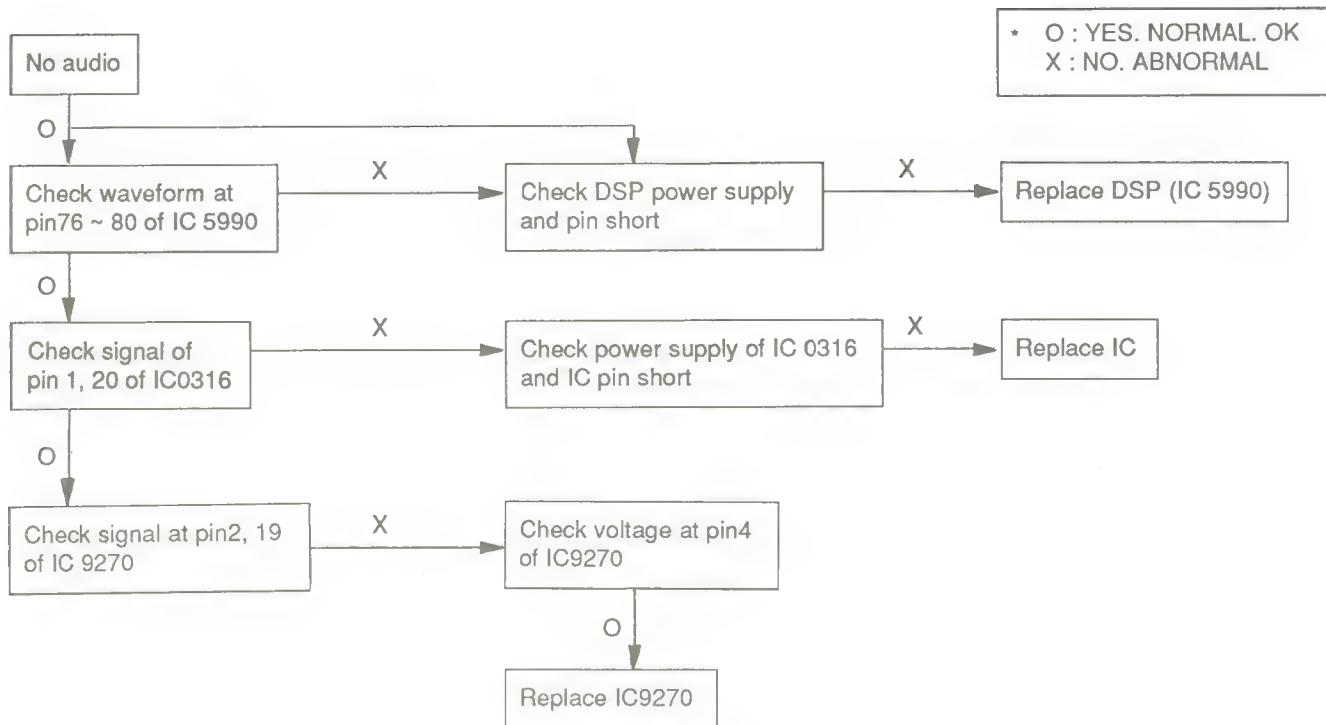


2) DISC NOT ROTATING

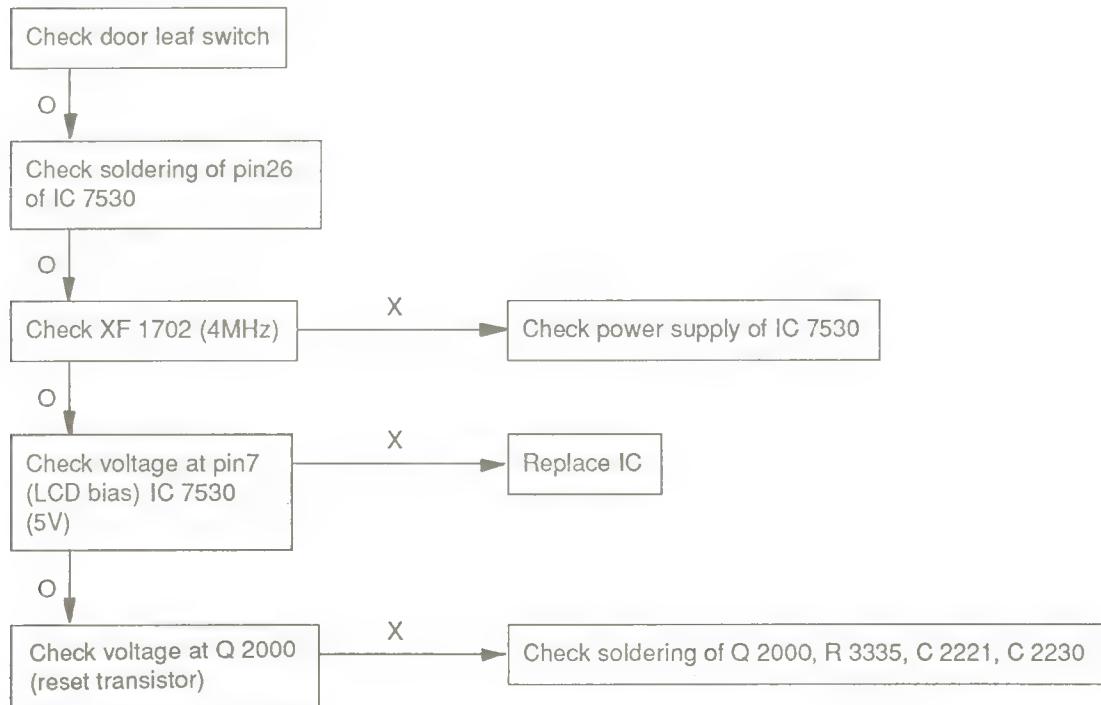
* O : YES. NORMAL. OK
X : NO. ABNORMAL



3) NO AUDIO



4) DISPLAY NOT WORKING



■ ADJUSTMENT

1. TUNER SECTION

1) MEASURING INSTRUMENTS REQUIRED

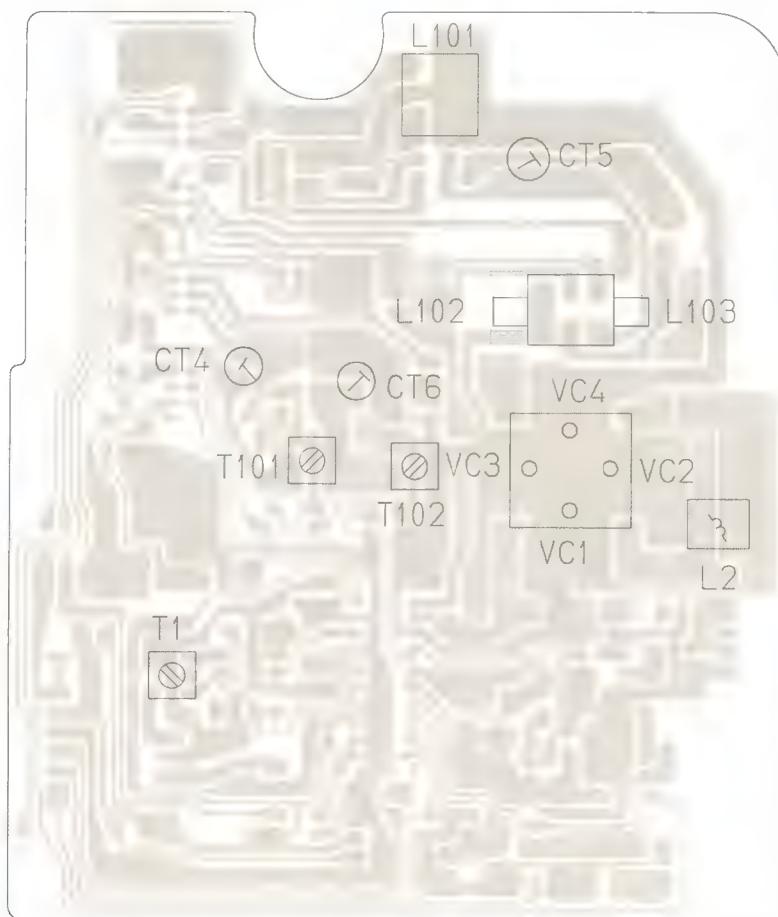
- (1) AM Standard Signal Generator (S.S.G)
: 100KHz ~ 35MHz, 400Hz, 30% MOD.
- (2) FM Standard Signal Generator (S.S.G)
: Output impedance 75Ω , 400Hz, 22.5KHz DEV.
- (3) IF Generator
FM: 10.7MHz
AM(MW)/LW/SW: 455 or 465KHz
- (4) Oscilloscope
- (5) VTVM
- (6) Frequency counter
- (7) Loop antenna
- (8) Dummy load (4Ω)

2) IMPORTANTS

- (1) Check the power source voltage.
- (2) Select desired Band and Function.
- (3) Set Tone Control at mid position.
- (4) Modulate AM to 30% amplitude with 400Hz signal and FM to 22.5KHz deviation with 400Hz signal.
- (5) Set Volume Control to approximately 50mW, 4Ω .

IC 101 FM/AM TUNER KA2293/TA8122AN

3) LOCATION OF ADJUSTMENT POINT : TUNER PCB (PARTS SIDE)



T1	: AM(MW)/LW/SW IF ADJ.	L102	: AM low tracking ADJ. (2-Band/SW)
T101	: SW low coverage ADJ. (SW)		: LW low tracking ADJ. (LW)
	: MW low coverage ADJ. (LW)	VC1	: FM high tracking ADJ.
T102	: AM low coverage ADJ. (2-Band/SW)	VC2	: FM high coverage ADJ.
	: LW low coverage ADJ. (LW)	VC3	: AM(MW) high coverage ADJ.
L1	: FM low tracking ADJ.	VC4	: AM(MW) high tracking ADJ.
L2	: FM low coverage ADJ.	CT4	: SW high coverage ADJ. (SW)
L101	: SW low tracking ADJ. (SW)	CT5	: LW high tracking ADJ. (LW)
L103	: MW Low tracking ADJ. (LW)	CT6	: LW high coverage ADJ. (LW)

4) ADJUSTMENT PROCEDURE

(1) FM ADJUSTMENT

ITEM	CONNECTION	STEP	S.S.G FREQUENCY	RADIO DIAL SETTING	ADJUSTMENT POINT	REMARK
IF Adjustment	Fig. 1	1	10.7MHz	Tune to the Lowest frequency	Not required	Checked
Frequency Coverage Adjustment	Fig. 2	2	87.3MHz	Tune to the Lowest frequency	L2 FM OSC coil	Best resonating point of SSG.
		3	108.2MHz	Tune to the highest frequency	VC2 OSC trimmer (VARICON)	Best resonating point of SSG.
		4	Repeat steps 2 and 3 several times.			
Tracking Adjustment	Fig. 2	5	90MHz	90MHz	L1 (FM RF coil)	Fixed
		6	106MHz	106MHz	VC1 ANT trimmer (VARICON)	Maximum Output
		7	Repeat steps 5 and 6 to obtain suitable sensitivity at 90MHz and 106MHz.			
Stereo Separation Adjustment	Connect Stereo Generator to S.S.G additionally in Fig. 2.	8	98MHz	98MHz	Not required	Best separation.

FM IF OUTPUT : IC101 (KA2293/TA8122AN) PIN NO. 19

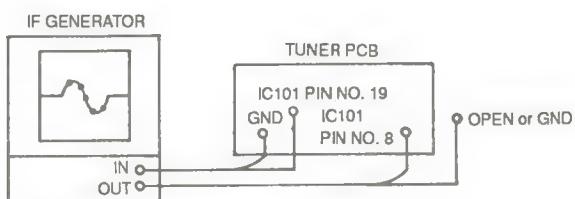


Fig. 1

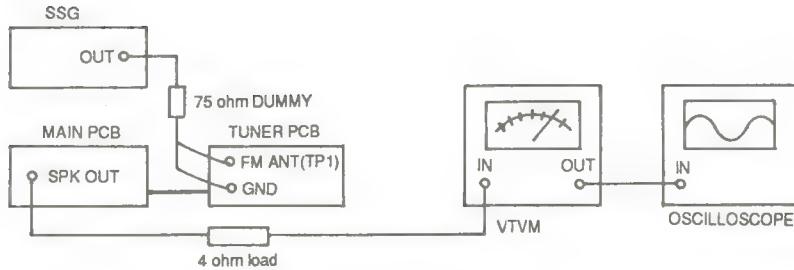


Fig. 2

(2) AM ADJUSTMENT

ITEM	CONNECTION	STEP	S.S.G FREQUENCY	RADIO DIAL SETTING	ADJUSTMENT POINT	REMARK
IF Adjustment	Connect FM/AM IF generator to loop ANT. Couple the AM ANT coil close to loop ANT and take out the signal from AM IF out point. (IC101 pin No 19) (See Fig. 3)	1	455KHz (465KHz)	Tune to the Lowest frequency	AM IFT T1 (WHT)	Maximum output and best "V" curve.
		2	Repeat 1 until no further improvement can be made.			
AM Coverage Adjustment	Fig. 4	3	515KHz	Tune to the Lowest frequency	AM OSC coil (RED) T102	Best resonating point of SSG.
		4	1650KHz *(1780KHz)	Tune to the highest frequency	AM OSC trimmer VC3 (VARICON)	Best resonating point of SSG.
		5	Repeat steps 3 and 4 several times			
AM Tracking Adjustment	Fig. 4	6	600KHz	600KHz	AM ANT coil L102	Maximum output.
		7	1400KHz	1400KHz	AM ANT trimmer (VC4) (VARICON)	Maximum output.
		8	Repeat steps 6 and 7 to obtain suitable sensitivity at 600KHz and 1400KHz.			

AM IF OUTPUT: IC 101 (KA2293/TA8122AN) PIN NO. 19.

* : USA

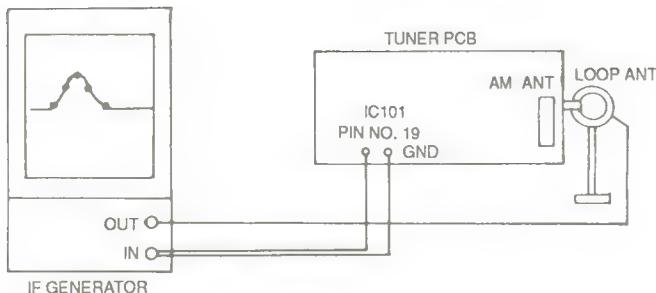


Fig. 3

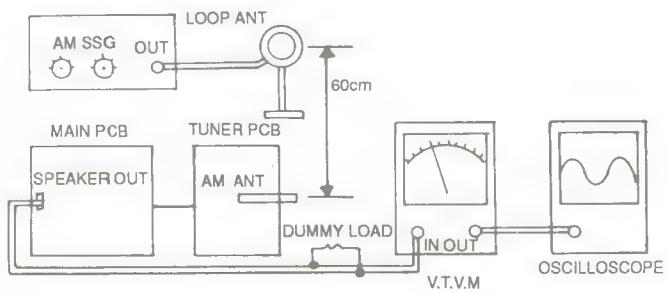


Fig. 4

(3) 3 BAND (FM/SW/AM) AM/SW ADJUSTMENTS

ITEM	CONNECTION	STEP	S.S.G FREQUENCY	RADIO DIAL SETTING	ADJUSTMENT POINT	REMARK
IF Adjustment	IF is same as 2 band's					
AM Coverage Adjustment	Same as 2 band's.					
AM Tracking Adjustment	Same as 2 band's.					
SW Frequency Coverage Adjustment	Connect AM(SW) signal generator to SW ANT terminal (TP1) thru SW dummy ANT and speaker output to VTVM across 4 ohm load. (see Fig. 5 Fig. 6)	1	5.7MHz	Tune to the Lowest frequency	SW OSC COIL T101	Best resonating point of SSG.
		2	18.5MHz	Tune to the highest frequency	SW OSC trimmer CT4	Best resonating point of SSG.
		3	Repeat steps 1 and 2 several times.			
SW Tracking Adjustment	Fig. 5, Fig. 6	4	7MHz	7MHz	SW ANT coil L101	Maximum output.
		5	15MHz	15MHz	Fixed	

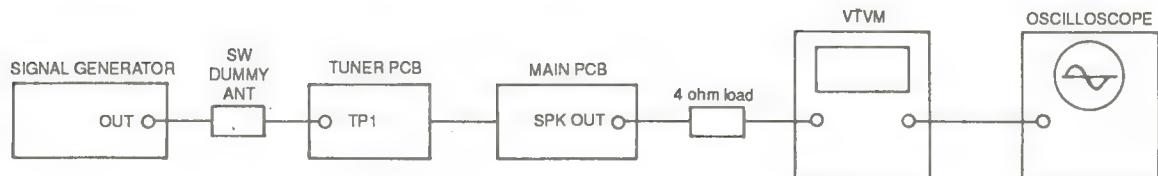


Fig. 5

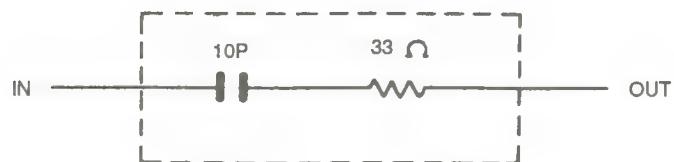


Fig. 6 SW DUMMY ANT

(4) 3 BAND (FM/MW/LW) MW(AM)/LW ADJUSTMENTS

ITEM	CONNECTION	STEP	S.S.G FREQUENCY	RADIO DIAL SETTING	ADJUSTMENT POINT	REMARK
IF Adjustment	IF is the same as 2 band's					
MW(AM) Frequency Coverage Adjustment	Fig. 4	1	515KHz	Tune to the lowest frequency	MW OSC coil T101 (RED)	Best resonating point of SSG.
		2	1650KHz	Tune to the highest frequency	MW OSC trimmer VC3	Best resonating point of SSG.
		3	Repeat steps 1 and 2 several times.			
MW(AM) Tracking Adjustment	Same as 2 band's (see Fig. 4)	4	600KHz	600KHz	MW ANT coil L102	Maximum output.
		5	1400KHz	1400KHz	MW ANT trimmer VC4(VARICON)	Maximum output.
		6	Repeat steps 4 and 5 to obtain suitable sensitivity at 600KHz and 1400KHz.			
LW Frequency Coverage Adjustment	Fig. 4	7	145KHz	Tune to the lowest frequency	LW OSC coil T102(BRN)	Best resonating point of SSG.
		8	295KHz	Tune to the highest frequency	LW OSC trimmer CT6	Best resonating point of SSG.
		9	Repeat steps 7 and 8 several times.			
LW Tracking Adjustment	Fig. 4	10	160KHz	160KHz	LW ANT coil L103	Maximum output.
		11	240KHz	240KHz	LW ANT trimmer CT5	Maximum output.
		12	Repeat steps 10 and 11 to obtain suitable sensitivity at 160KHz and 240KHz.			

2. TAPE SECTION

1) MEASURING INSTRUMENTS REQUIRED

- (1) Oscilloscope
- (2) VTVM
- (3) Frequency counter
- (4) Test tape
 - ① MTT-111 (or equivalent) : 3KHz signal is recorded. → Tape Speed Adjustment.
 - ② MTT-113CN (or equivalent) : 8KHz signal is recorded. → Head Azimuth Adjustment

2) ADJUSTMENT PROCEDURE

(1) HEAD AZIMUTH ADJUSTMENT

- ① Connect the equipments as shown in the Fig. 7.
- ② Insert a test tape (8KHz : MTT-113CN) into deck.
- ③ Press PLAY (▶) and set VOLUME at approximately 50mW (4Ω).
- ④ Adjust the azimuth adjustment screw for the maximum and balanced channel output (Fig. 8).
- ⑤ Secure the adjustment screw with glue after adjustment is complete.

(2) RECORDING BIAS ADJUSTMENT

- ① Connect C302 of Main PCB to the Frequency Counter. (Fig. 9)
- ② Press RECORD (●) and set FM-MODE switch to "MONO".
- ③ Adjust T301 so that the Frequency Counter reads 50KHz.

(3) TAPE SPEED ADJUSTMENT

- ① Connect the equipments as shown in the Fig. 7.
- ② Insert a test tape (3KHz : MTT-111) into deck.
- ③ Adjust adjustment hole of motor so that the Frequency Counter reads 3KHz. (Fig. 10)

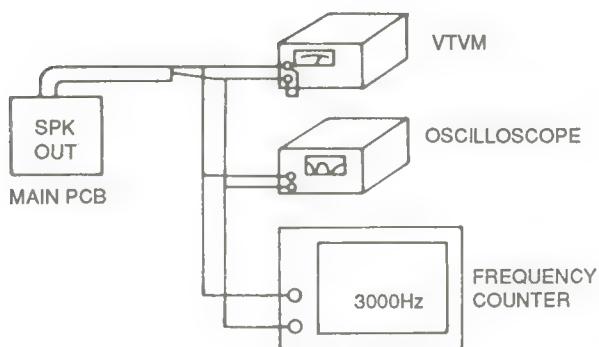


Fig. 7

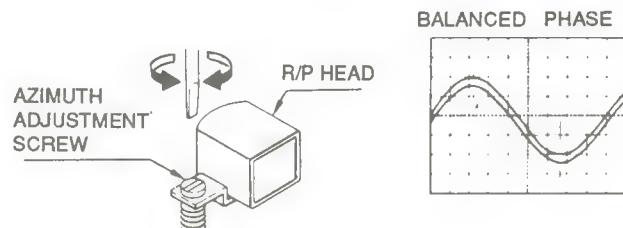


Fig. 8

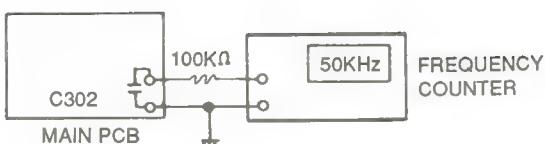


Fig. 9

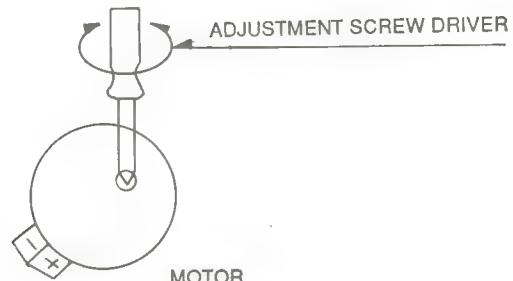


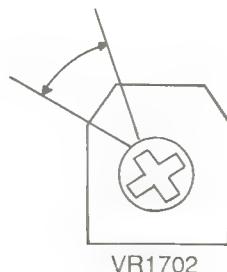
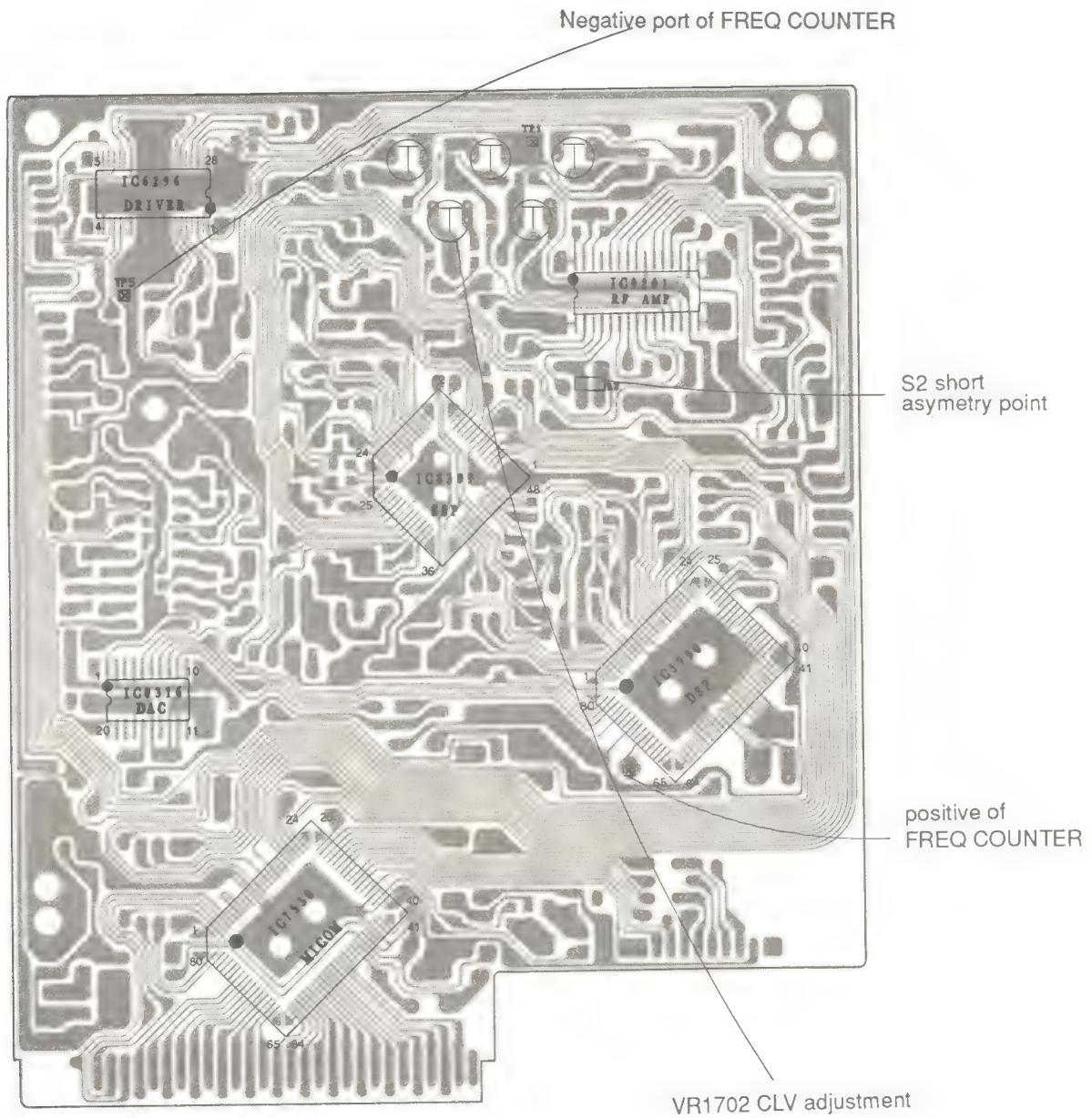
Fig. 10.

3. CD SECTION

1) CLV ADJUSTMENT

10 : 1 damping probe.

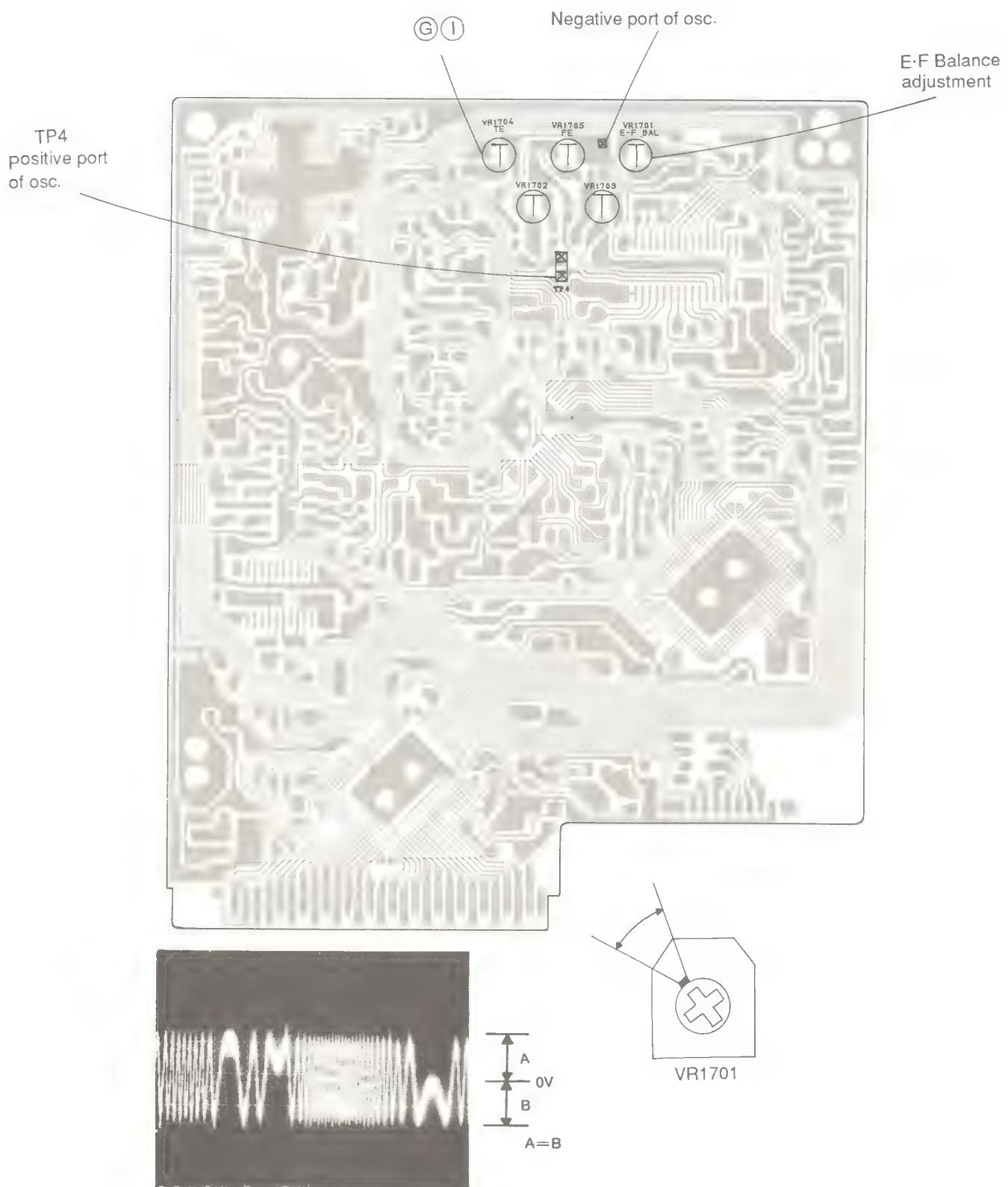
- Turn power on without loading a disc.
- Connect S2 (Asymmetry ; short)
- Connect TP5 to GND and TP2 to positive terminal on the Frequency Counter.
- Adjust VR 1702 so that the Frequency Counter reads $4.28\text{MHz} \pm (0.01\text{MHz})$
- Disconnect S2.



VR1702

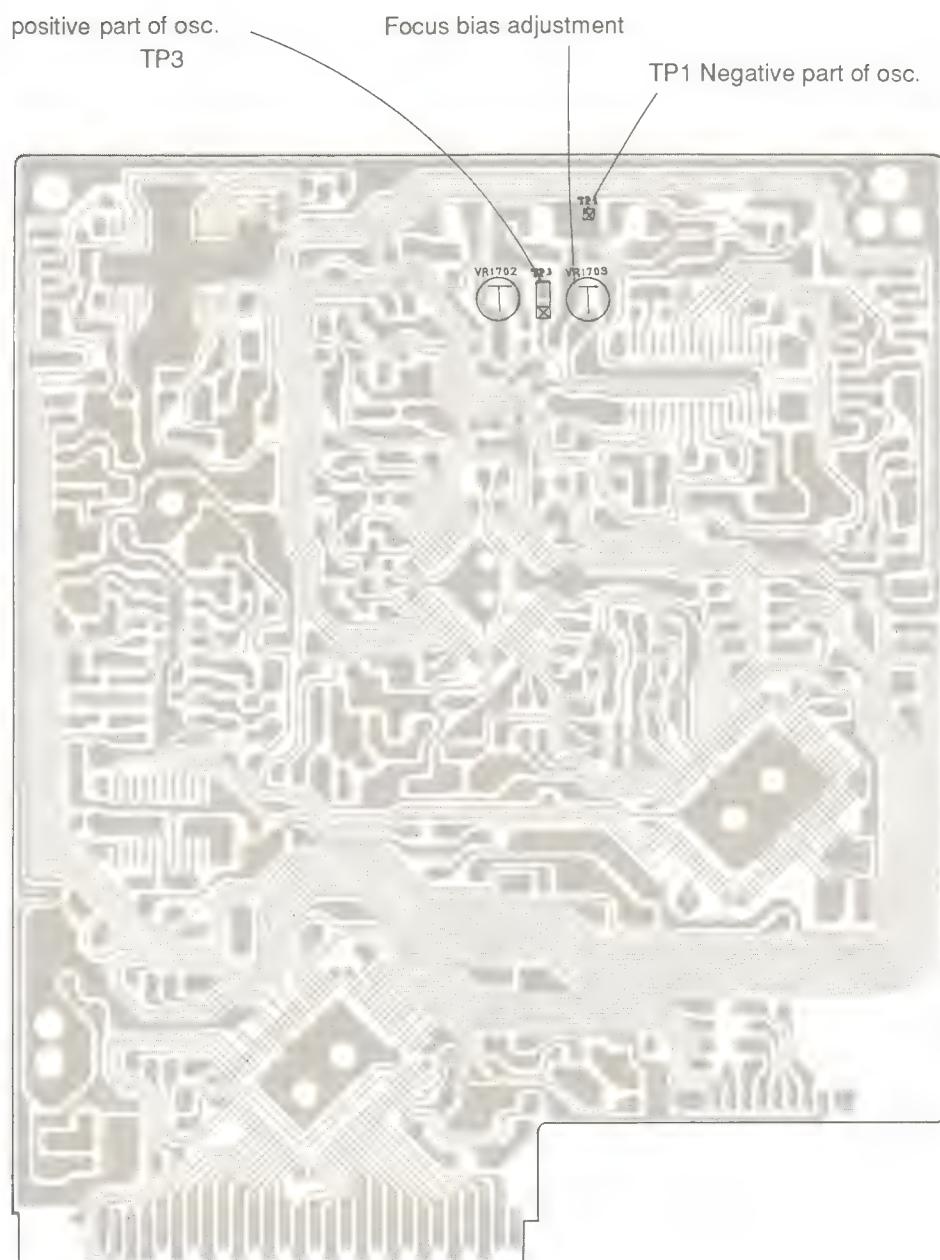
2) EF BALANCE ADJUSTMENT (Power On)

- A. Set Oscilloscope Time/Div to 2mS.
- B. Set Oscilloscope Volt/Div to 0.5V.
- C. Connect TP1 (Vref) to GND and TP4 (T.E) to positive terminal on the oscilloscope.
- D. Press PLAY with loading a disc.
- E. Adjust VR1704 all the way counter clockwise. (Intermittent Sound)
- F. Adjust VR1701 so that the waveform is equally symmetrical above and below (A = B) the Center.
- G. Adjust VR1704 so that Sound comes out normally (Nearly mid-position of VR1704).



3) FOCUS BIAS ADJUSTMENT

- A. Turn power on without loading a disc.
- B. Set Oscilloscope Vol/Div to DC 0 mV.
- C. Connect TP1 (Vref) to GND and TP3 (F.E) to positive terminal on the oscilloscope.
- D. Adjust VR1703 so that the voltage is 0 mV DC on the oscilloscope.



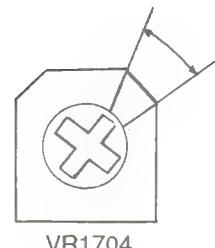
VR1703

4) TRACKING GAIN ADJUSTMENT (Power On)

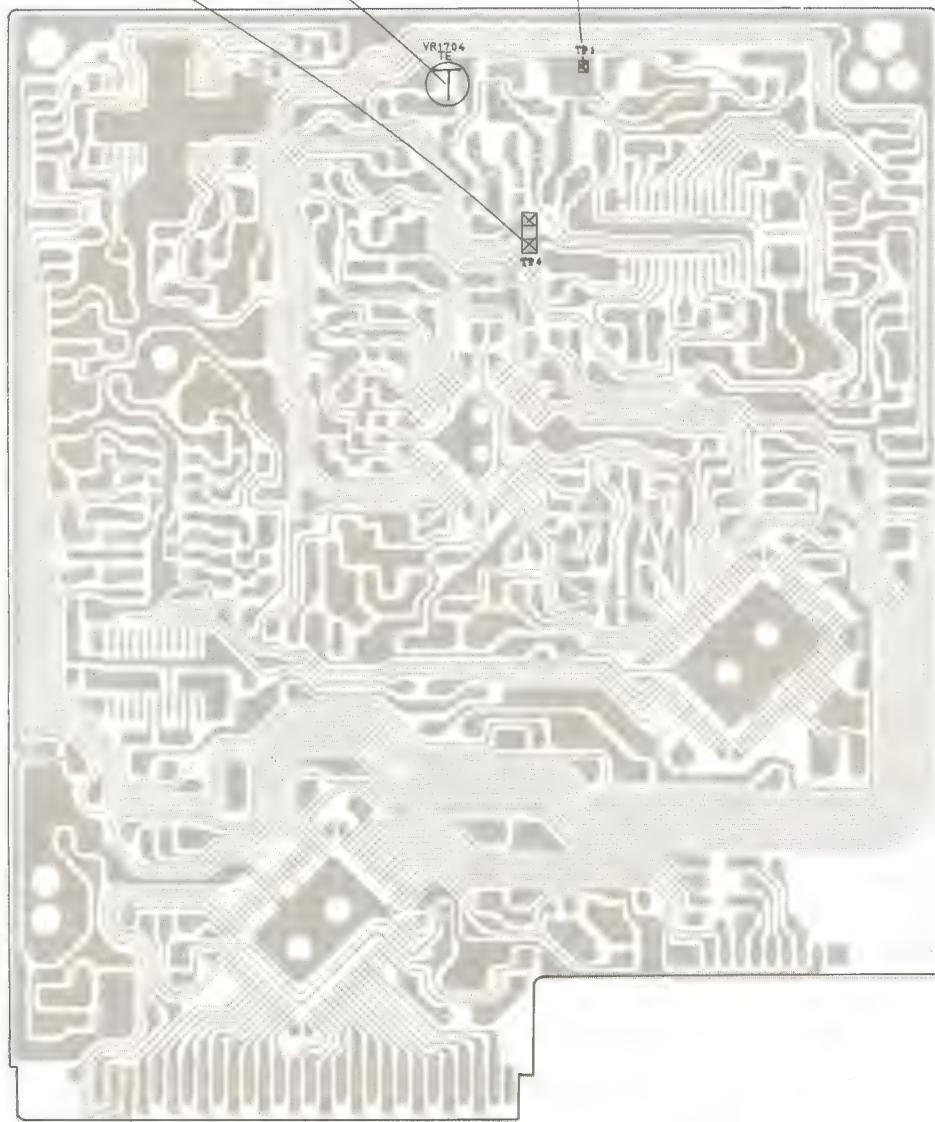
A. Connect TP1 (Vref) to GND and TP6 (T.E) to positive terminal on the oscilloscope.

B. Press PLAY with loading a disc.

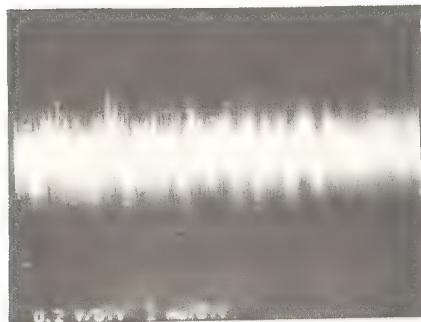
C. Adjust VR 1704 so that Waveform is as shown in the figure below.



TP4 positive port of osc. Tracking gain adjustment TP1 Negative port of osc.

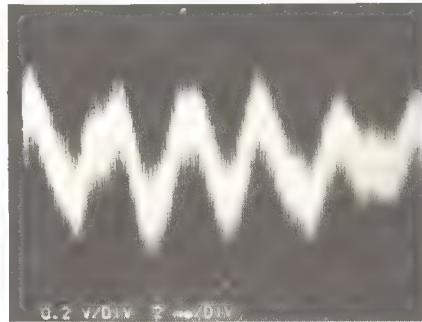


(NORMAL WAVEFORM)



VOLT/DIV : 0.2V
TIME/DIV : 2mS

(LOW TRACKING GAIN)



VOLT/DIV : 0.2V
TIME/DIV : 2mS

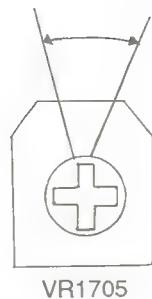
(HIGH TRACKING GAIN)



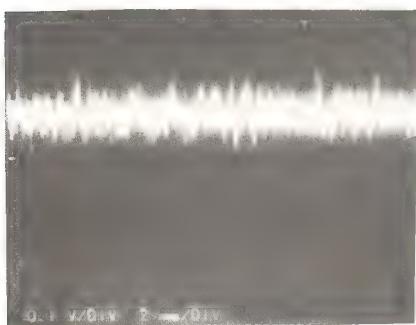
VOLT/DIV : 0.2V
TIME/DIV : 2mS

5) FOCUS GAIN ADJUSTMENT (Power ON)

- Connect TP1 (Vref) to GND and TP7(F.E) to positive terminal on the oscilloscope.
- Press PLAY with loading a disc.
- Adjust VR 1705 so that the waveform is as shown in the figure below.



(NORMAL WAVEFORM)



VOLT/DIV : 0.1V
TIME/DIV : 2mS

(LOW FOCUS GAIN)



VOLT/DIV : 0.1V
TIME/DIV : 2mS

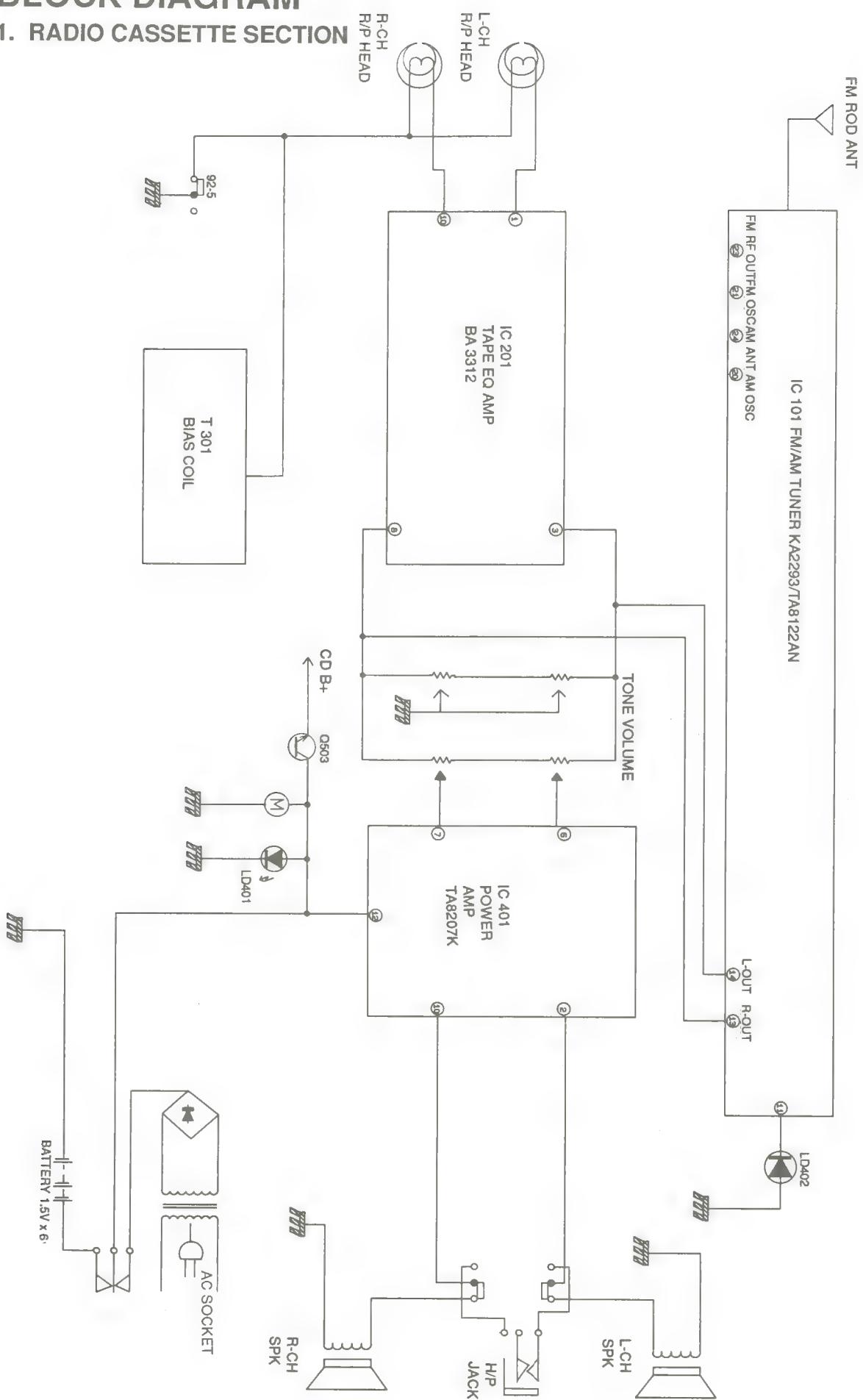
(HIGH FOCUS GAIN)



VOLT/DIV : 0.1V
TIME/DIV : 2mS

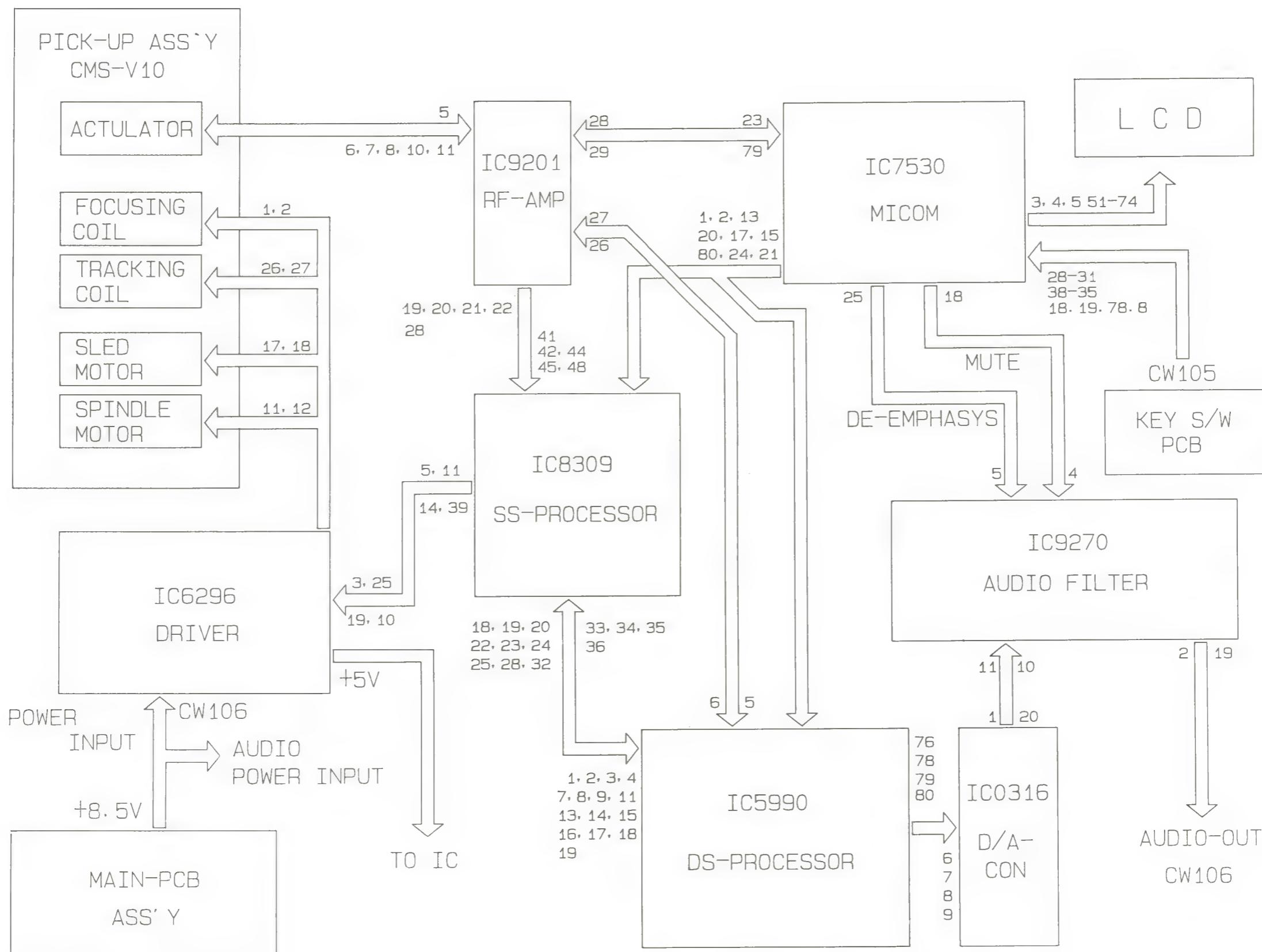
BLOCK DIAGRAM

1. RADIO CASSETTE SECTION



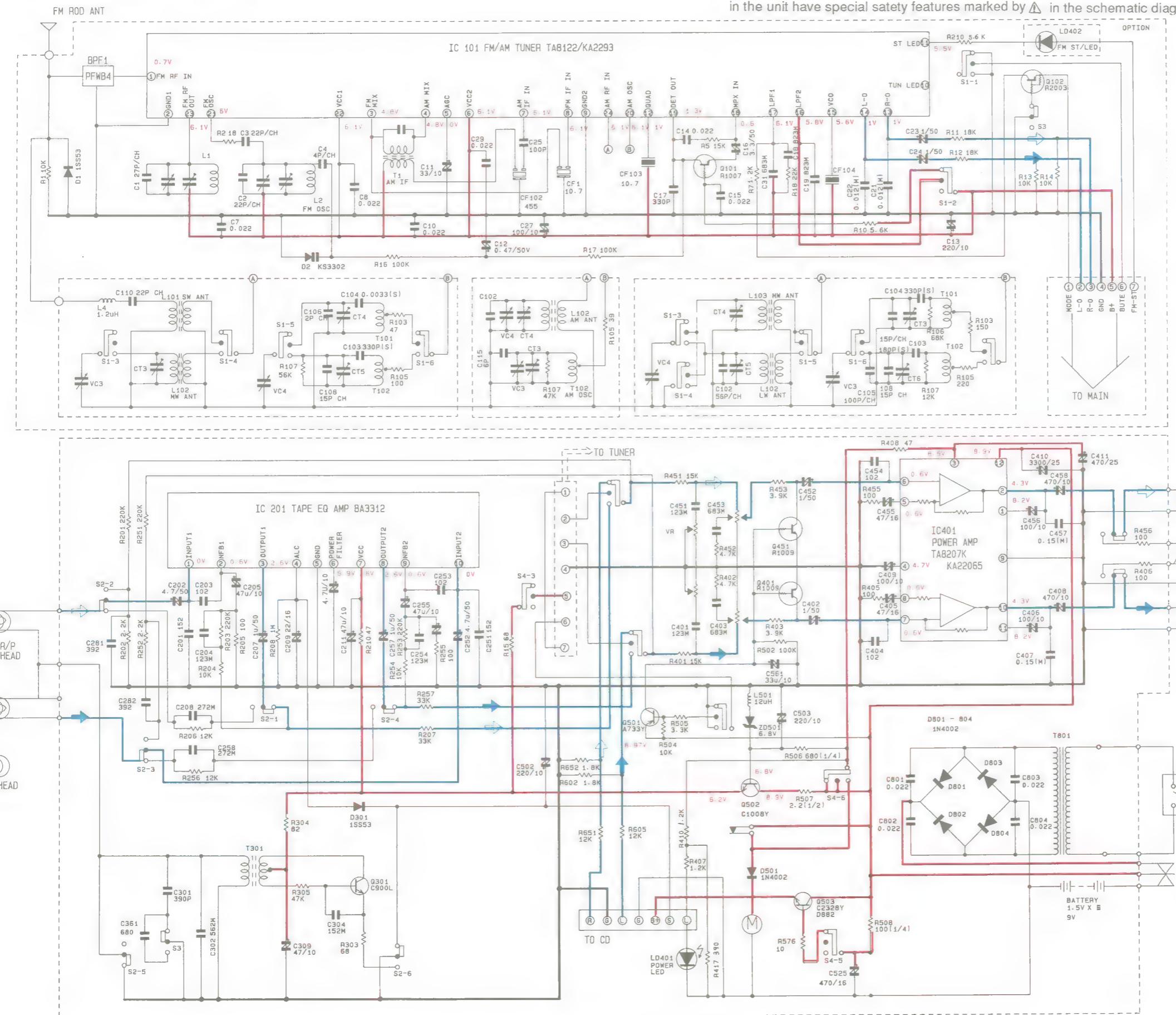
2. CD SECTION

CDP BLOCK-DIAGRAM
G3SCHIP CD-PACK ASSY



SCHEMATIC DIAGRAM

1. RADIO CASSETTE SECTION



2. CD SECTION

1. All resistors are in ohm (K = K ohm, M = M ohm) of, unless otherwise noted, wattage values (1/4, 1/8W).

2. All capacitance values are indicated in μ F, pF.

3. The schematic diagram is subject to change upon improvement without prior notice.

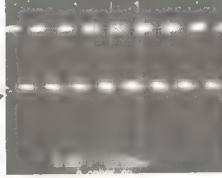
4. Be sure to use identical and standardized replacement parts, especially for critical parts in the unit since many parts in the unit have special safety features marked by Δ in the schematic diagram and parts list.

output of LRCK



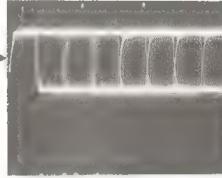
VOLT/DIV : 2V
TIME/DIV : 5 μ s

output of WDCK



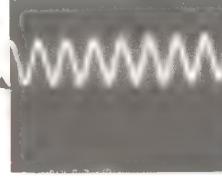
VOLT/DIV : 2V
TIME/DIV : 5 μ s

output of DATA



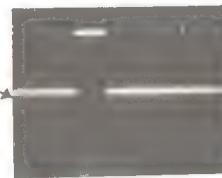
VOLT/DIV : 2V
TIME/DIV : 0.2 μ s

output of Bit clock



VOLT/DIV : 2V
TIME/DIV : 0.2 μ s

output of sub-code Q



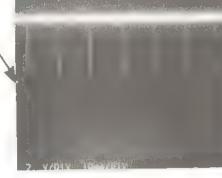
VOLT/DIV : 2V
TIME/DIV : 10ms

output of sub-code synchro.



VOLT/DIV : 2V
TIME/DIV : 10ms

clock for reading sub-code Q



VOLT/DIV : 2V
TIME/DIV : 10 ms

G3SCHIP

SCHEMATIC DIAGRAM

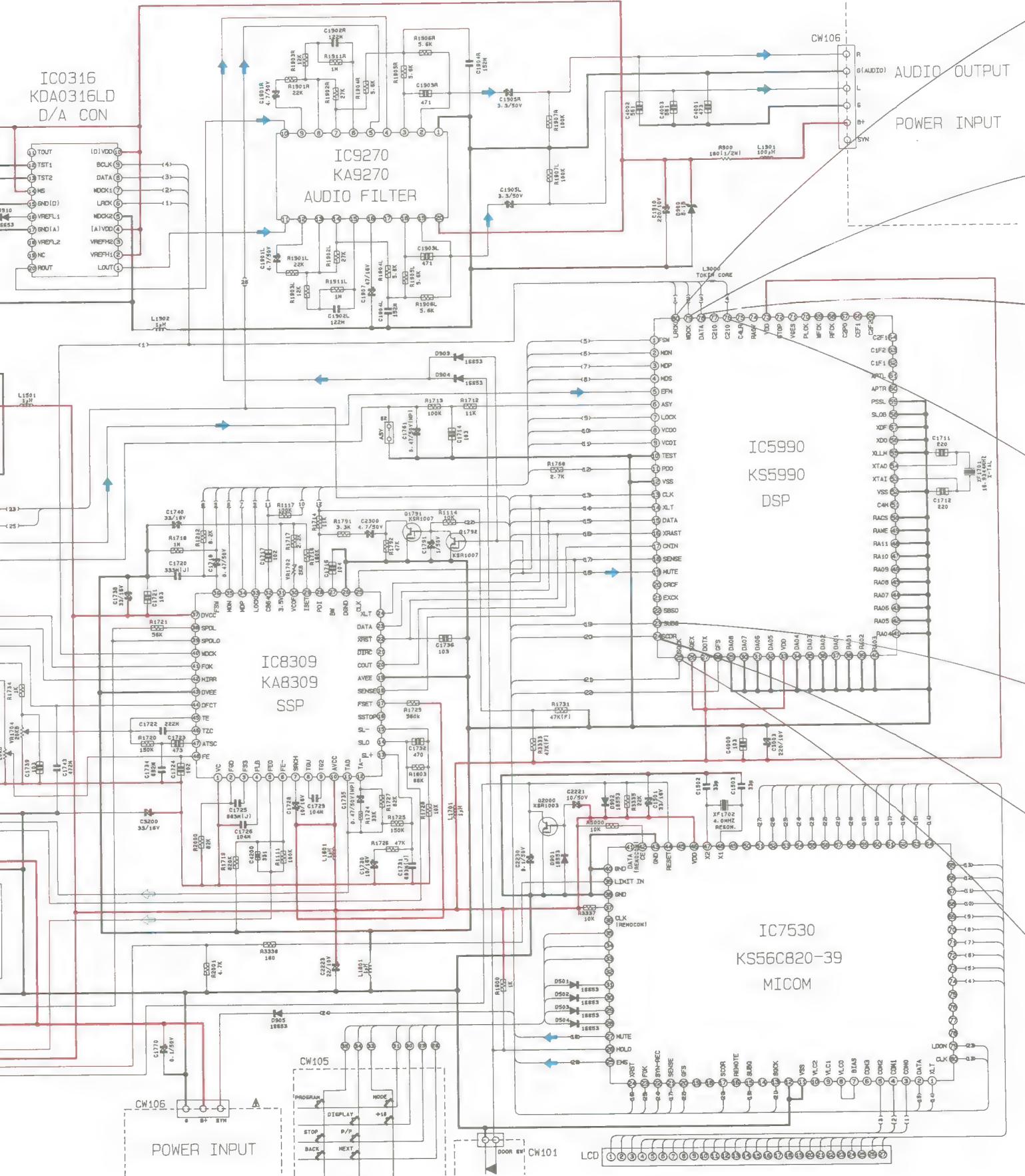
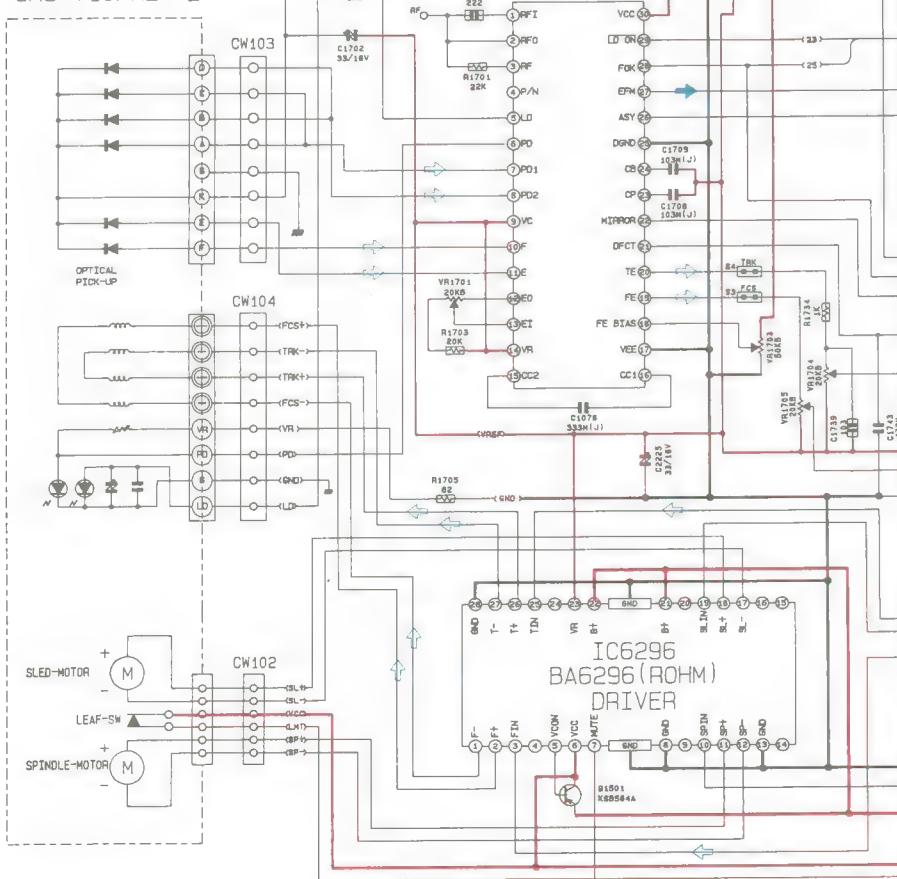
<NOTE>

1. All resistors are in ohm (K=K ohm, M=M ohm) or, unless otherwise noted, wattage values (1/2W, 1/10W).
2. All capacitance values are indicated in μ F, pF.
3. The schematic diagram is subject to change upon improvement without prior notice.
4. Be sure to use identical and standardized replacement parts, especially for critical parts in the unit since many parts in the unit have special safety features marked by Δ in the schematic diagram and parts list.

→ AUDIO(EMF)

→ SERVO(TRACKING, FOCUSING)

DECK-CD CMS-V10/NEW Δ

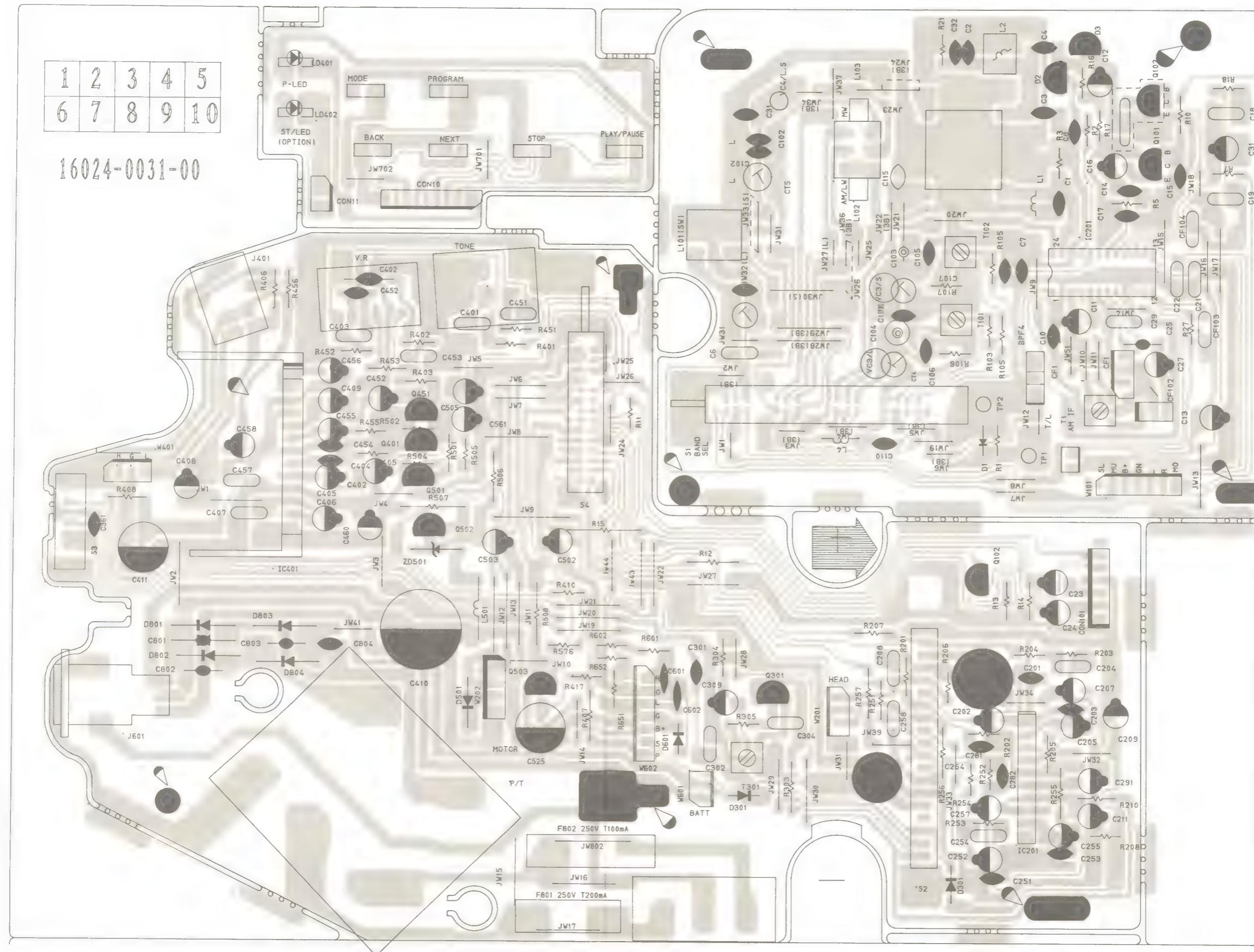


POWER INPUT

PCB PATTERN & MARKING DIAGRAM

1. RADIO CASSETTE SECTION (PARTS SIDE)

1. All resistors are in ohm (K = K ohm, M = M ohm) of, unless otherwise noted, wattage values (1/4, 1/8W).
2. All capacitance values are indicated in μ F, PF.
3. The schematic diagram is subject to change upon improvement without prior notice.
4. Be sure to use identical and standardized replacement parts, especially for critical parts in the unit since many parts in the unit have special safety features marked by  in the schematic diagram and parts list.



2. CD SECTION (PATTERN SIDE)

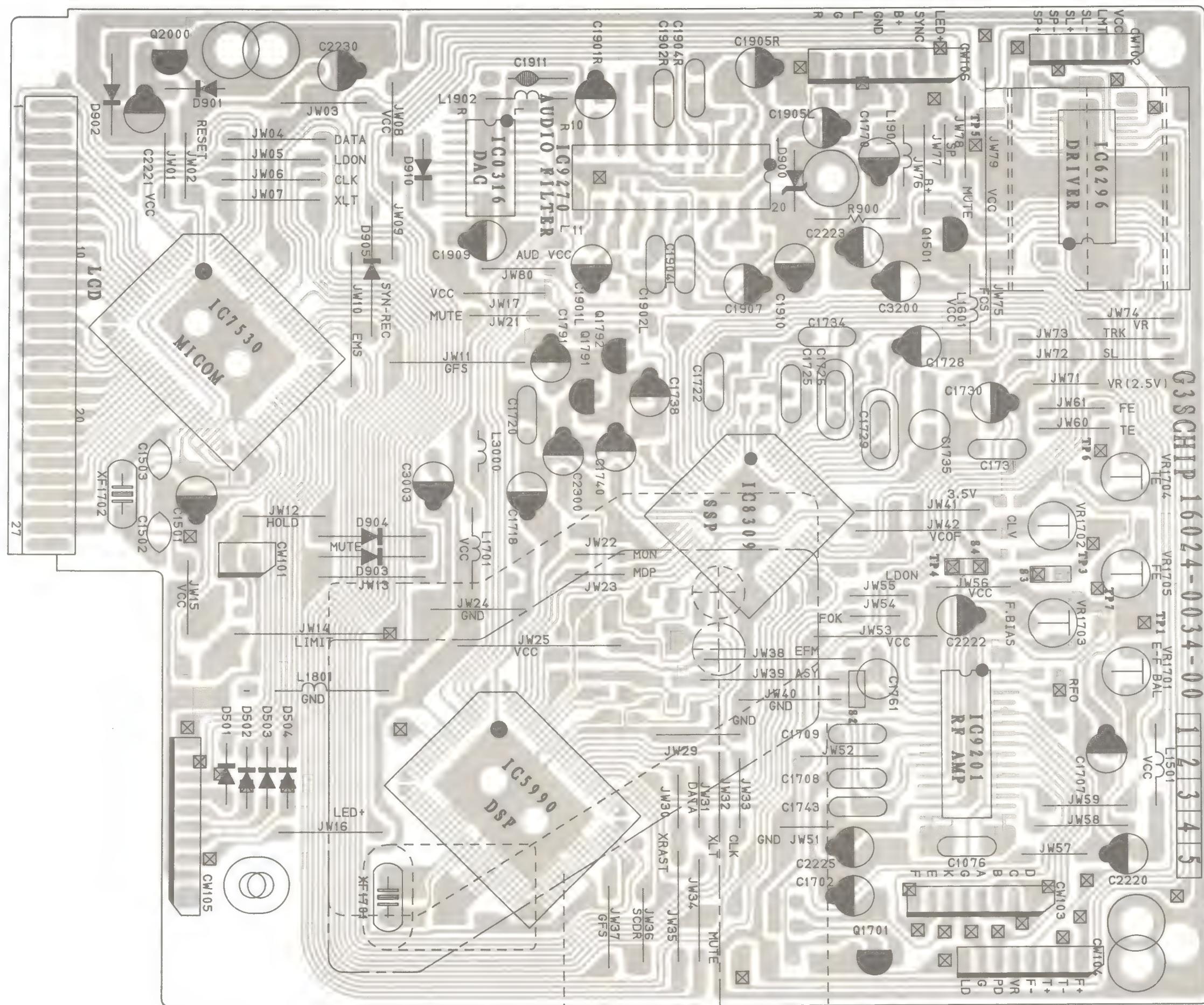
A

B

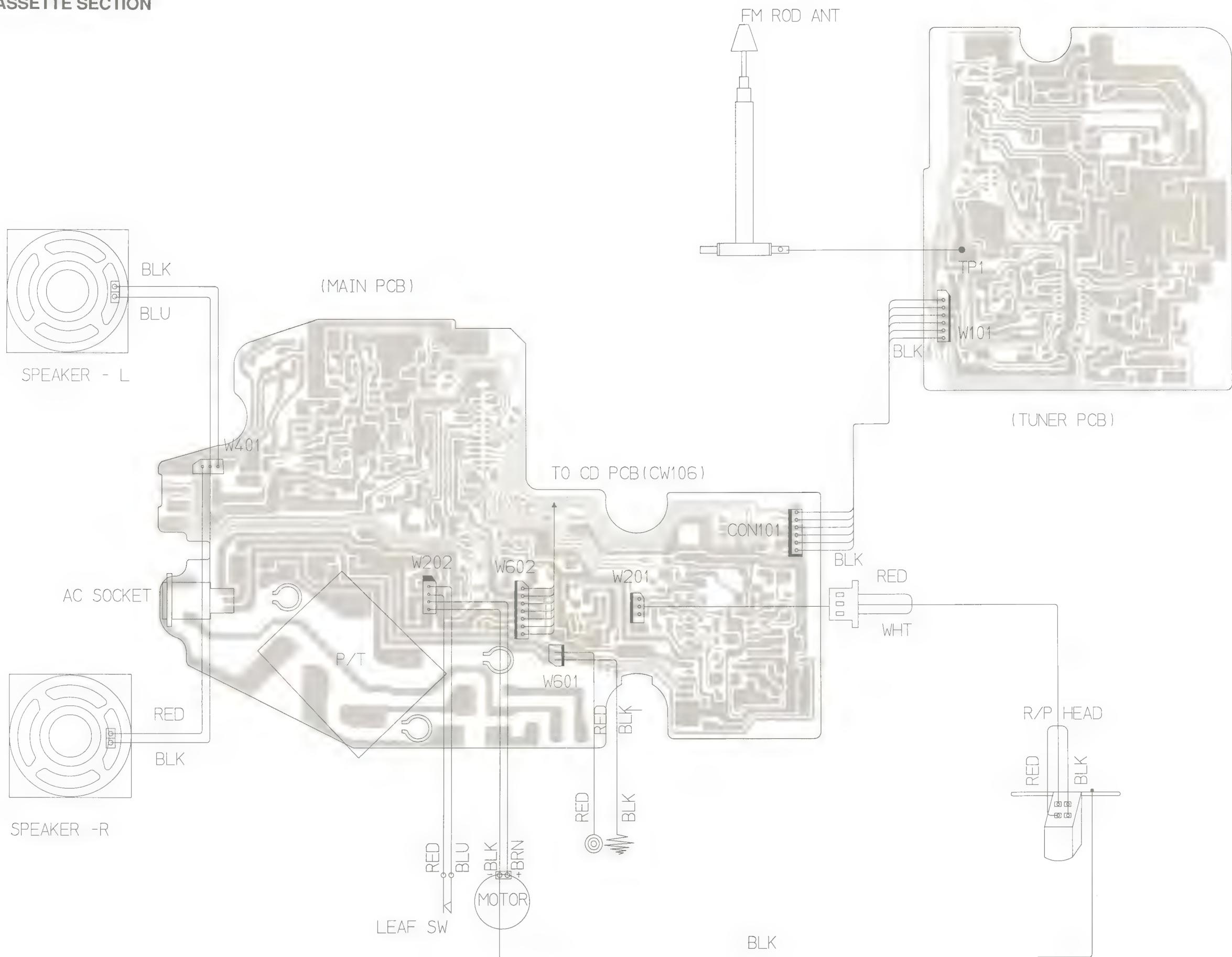
0

1

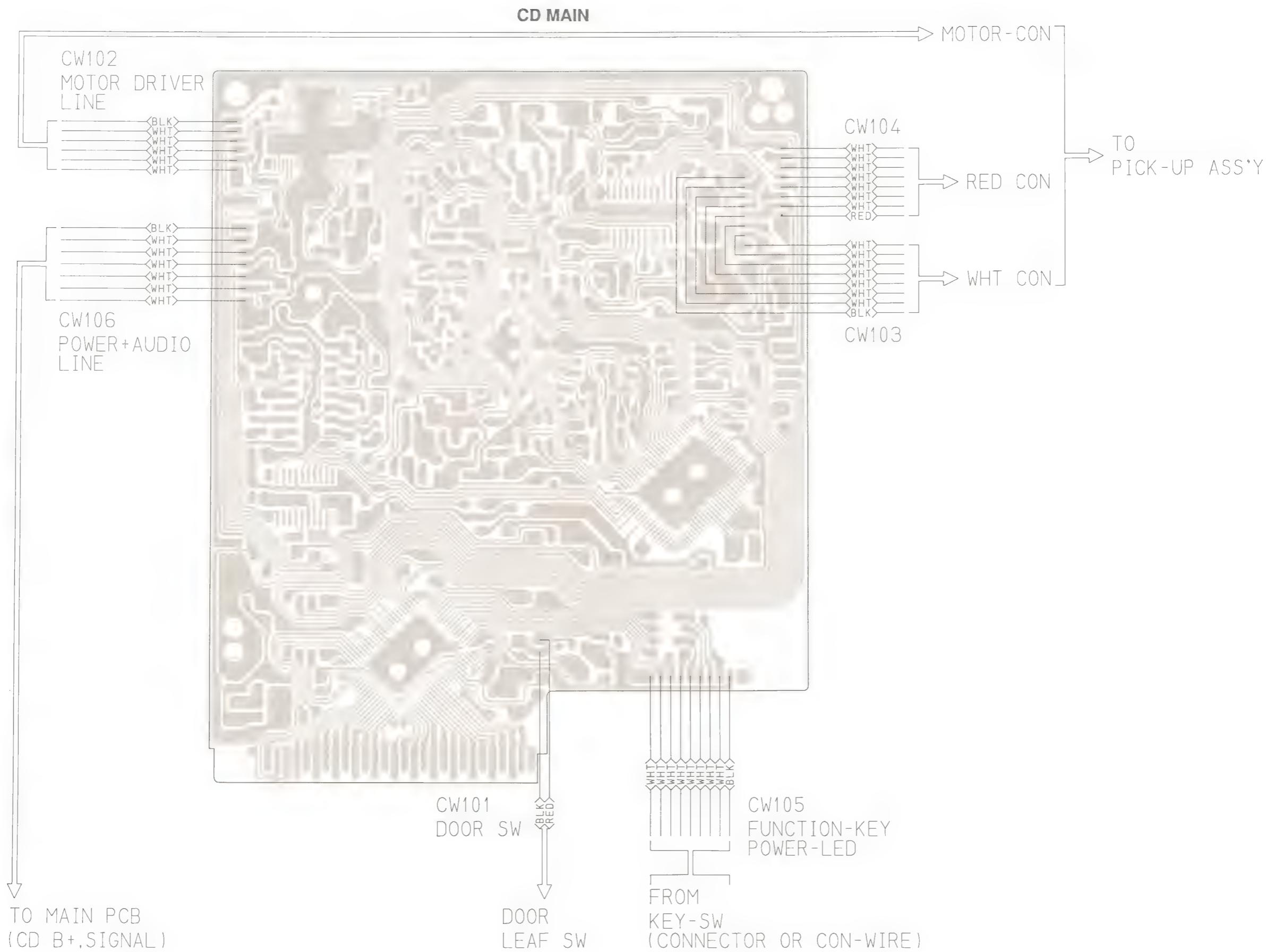
VI



■ WIRING DIAGRAM
1. RADIO CASSETTE SECTION

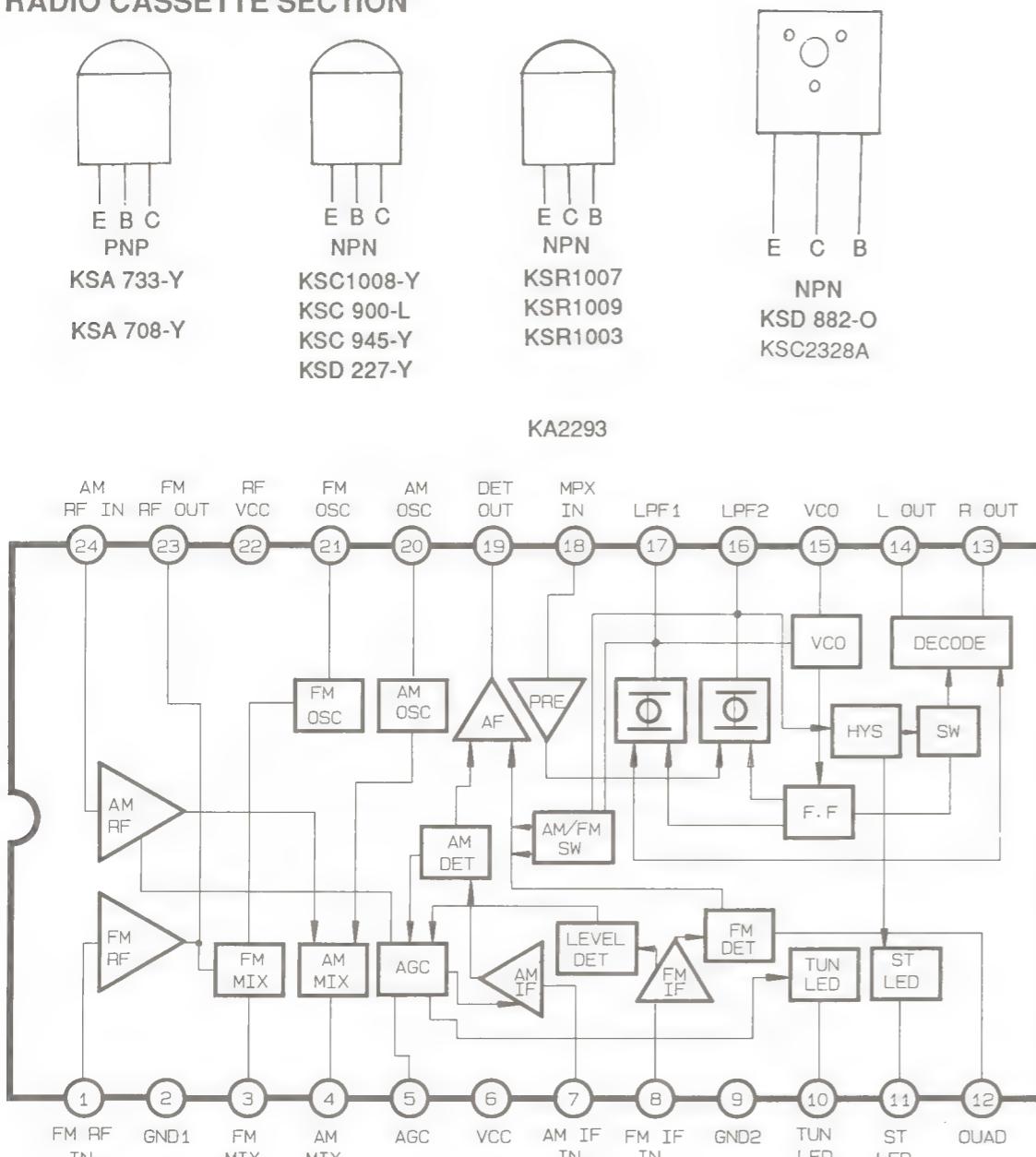


2. CD SECTION

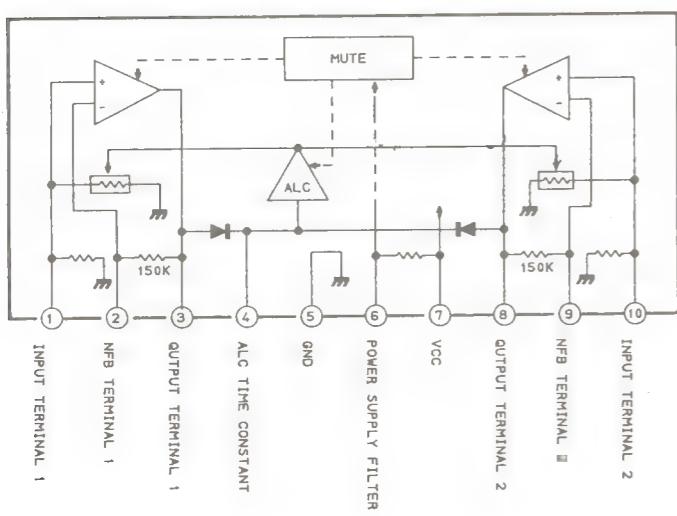


IC AND TR LEAD LAY OUT

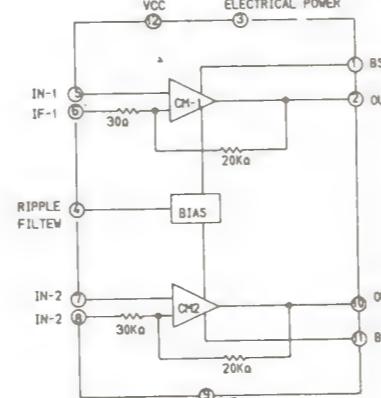
1. RADIO CASSETTE SECTION



BA3312N (TAPE EQ AMP) : IC201

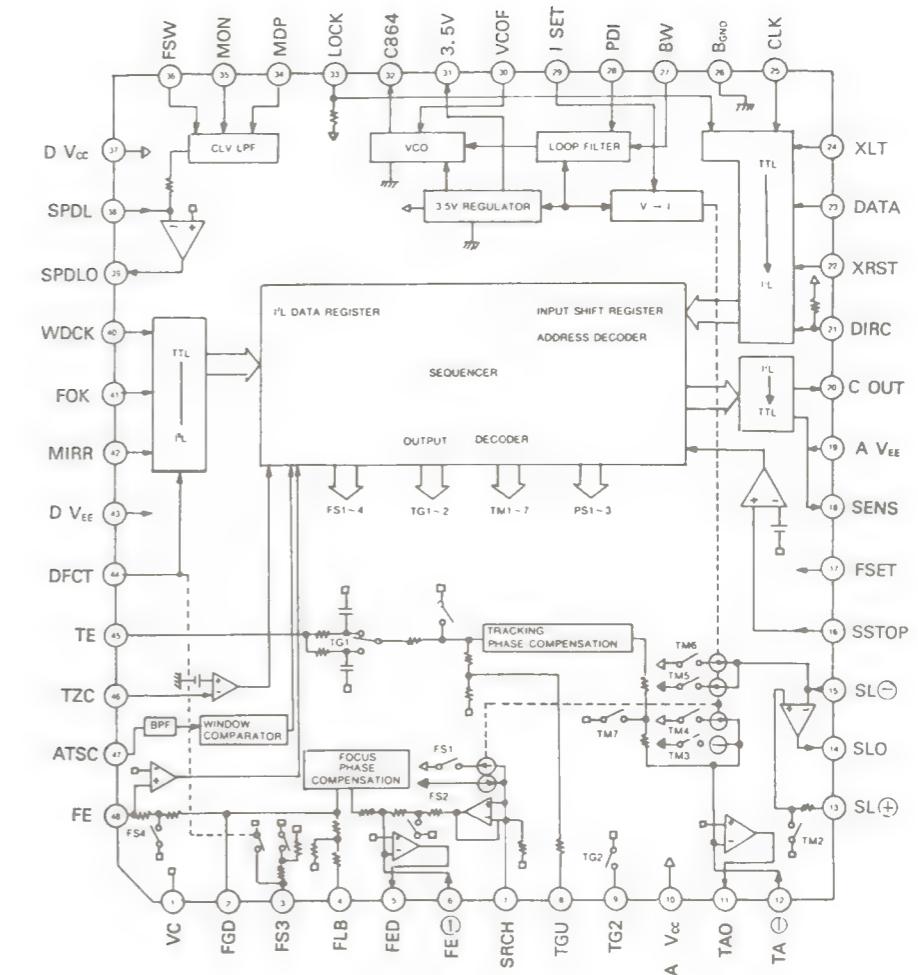


TA8207K(POWER AMP) : IC401

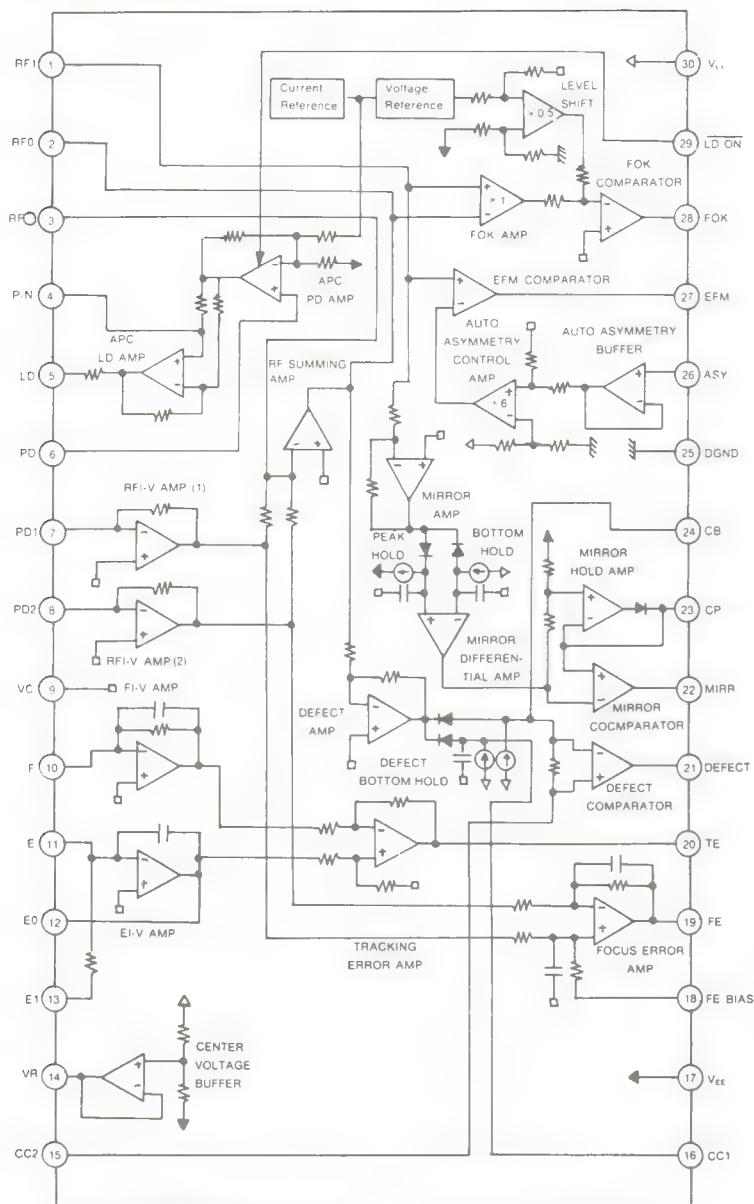


2. CD SECTION

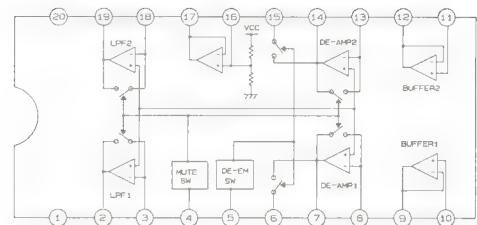
• KA8309 (SERVO SIGNAL PROCESSOR) : IC8309



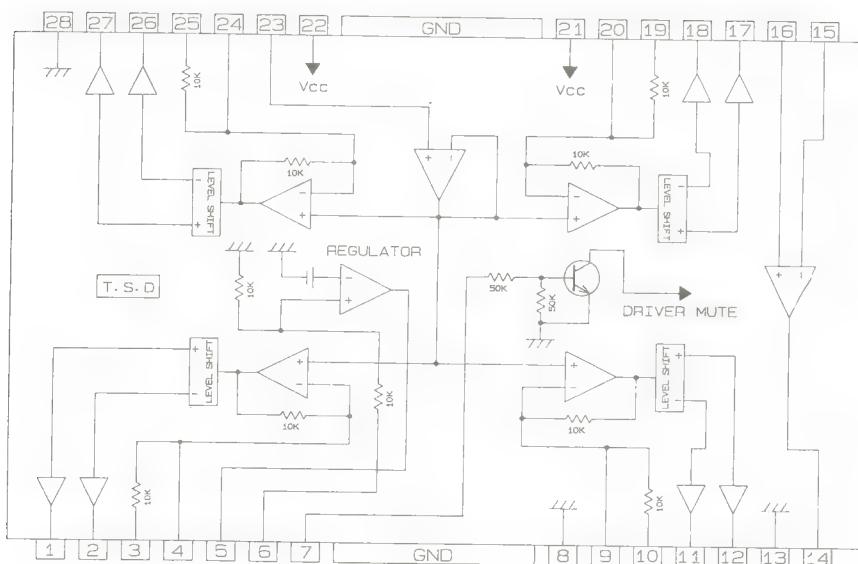
● KA9201 (RF AMP) : IC9201



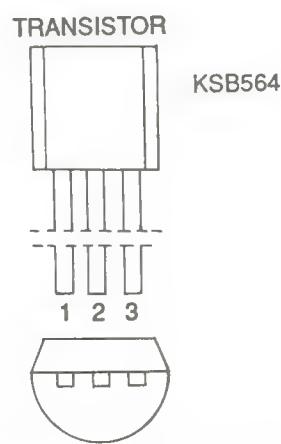
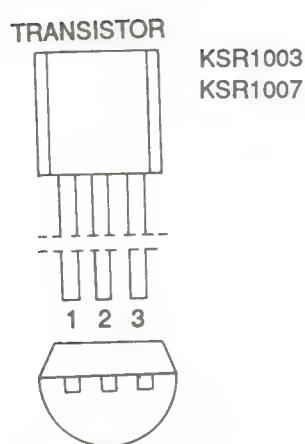
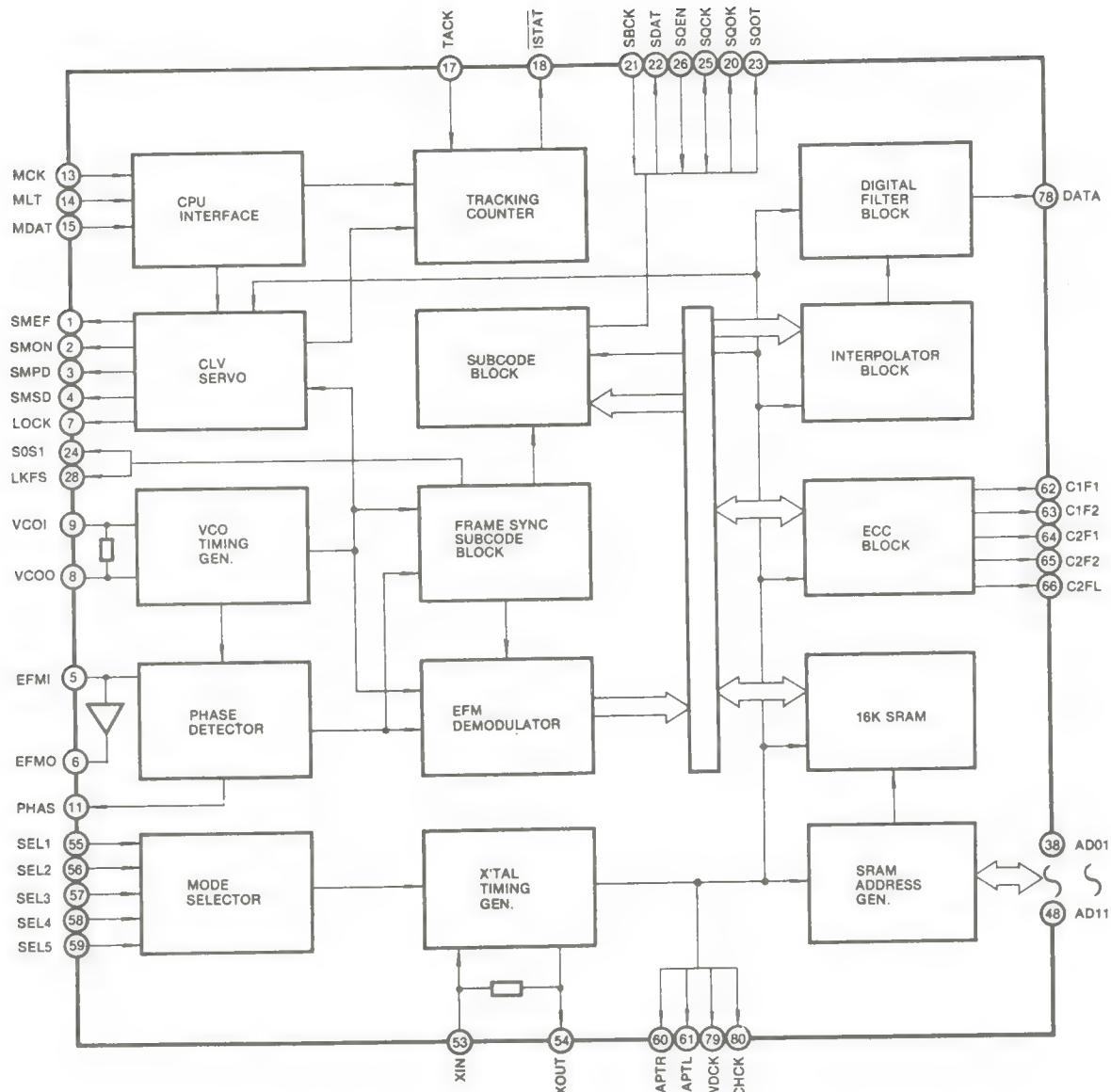
● BA6296FP (IC6296)



● KA9270 : IC9270



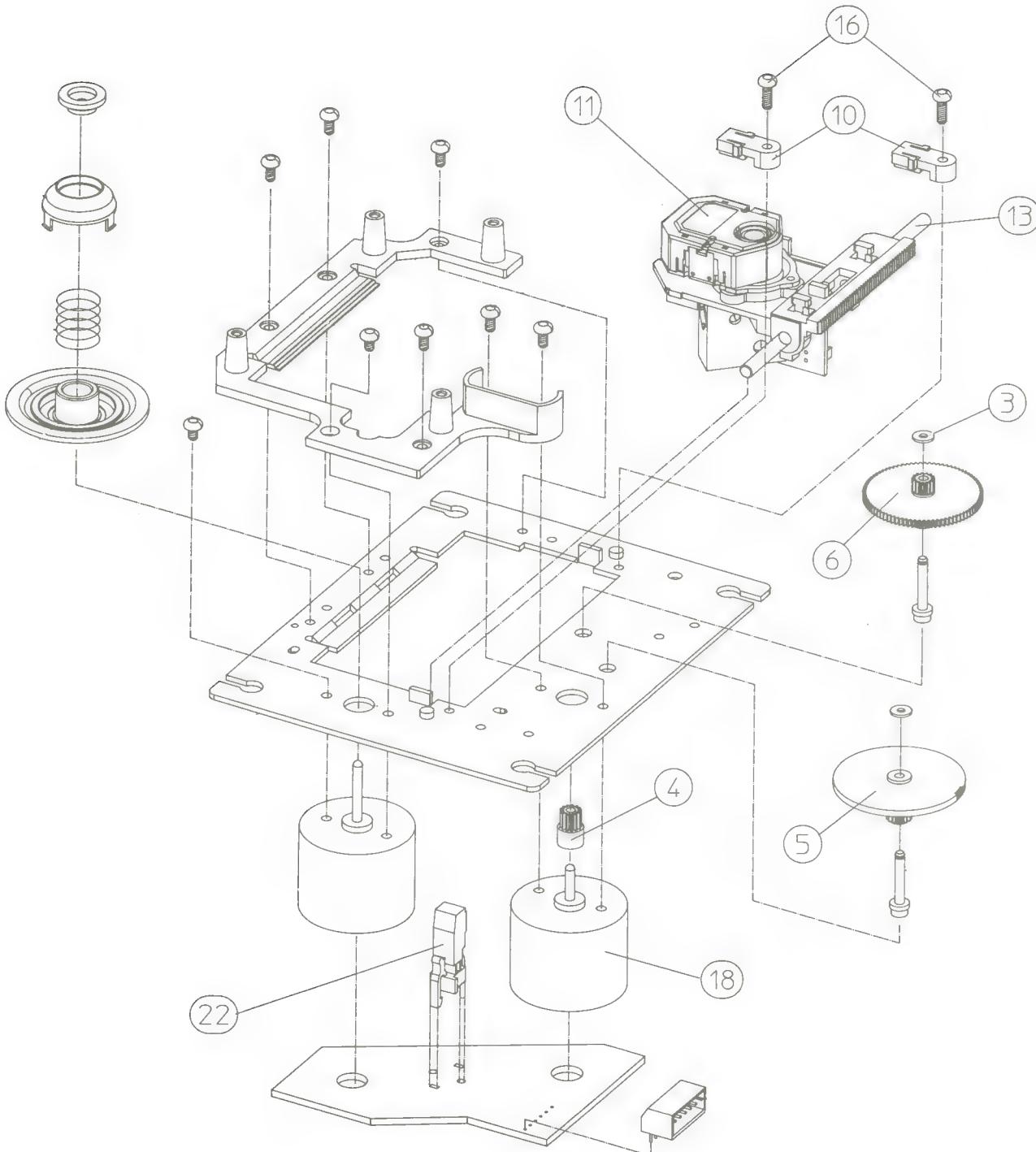
● KS5990 (DIGITAL PROCESSOR) : IC5990



1. Emitter 2. Collector 3. Base 1. Emitter 2. Base 3. Collector

EXPLDED VIEW

1. CD DECK (CMS-V10)

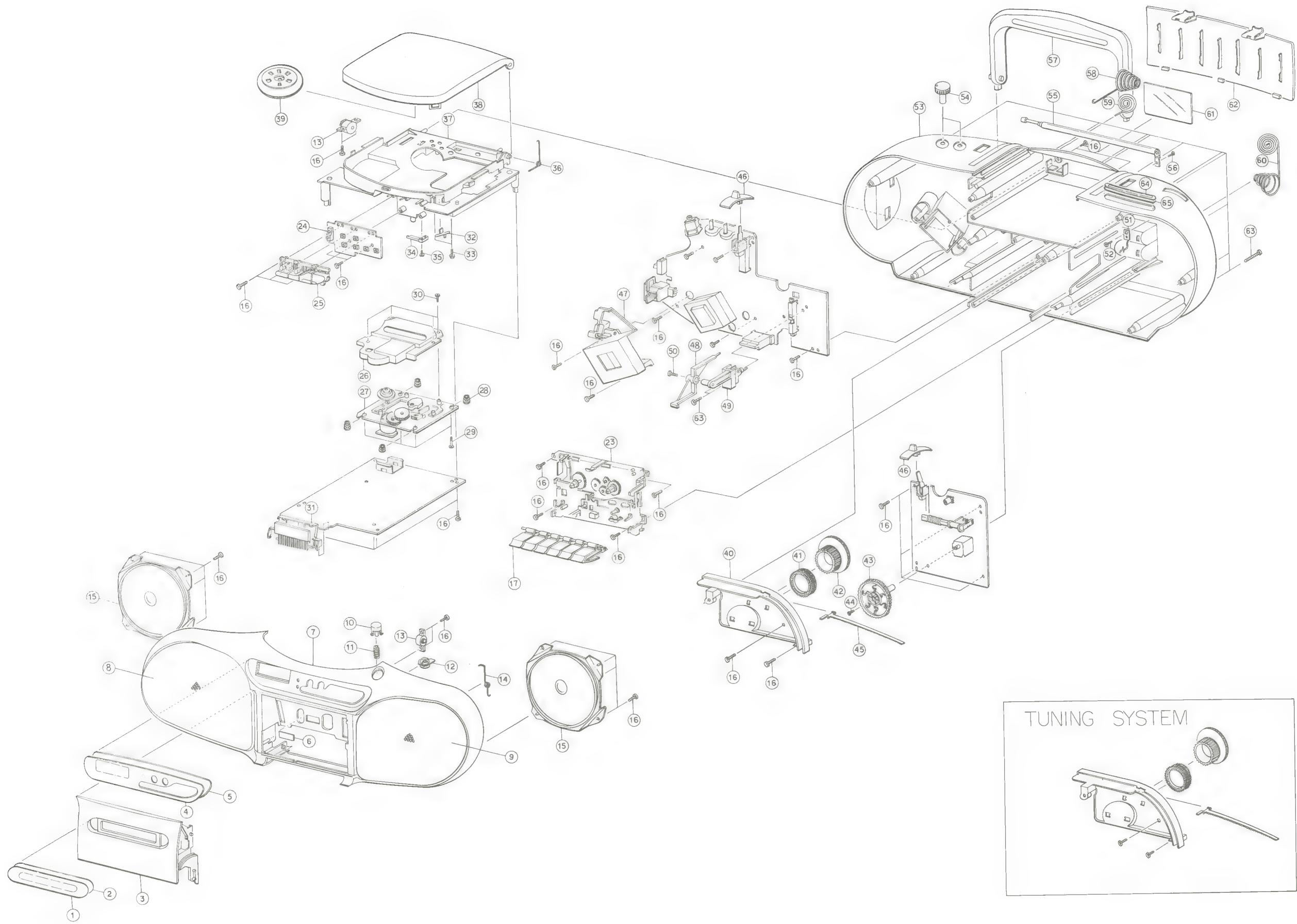


DECK ASS'Y : CMS-V10 (14929-407-010)

NO.	CODE NO.	DESCRIPTION & SPECIFICATION	Q'TY
4	15214-510-510	GEAR-P/U (A) ; P.O.M (DURACON KT-20)	1
5	15214-510-610	GEAR-P/U (B) ; NYLON 12	1
6	15214-510-710	GEAR-P/U (C) ; P.O.M (DURACON KT-20)	1
10	16033-505-210	HOLDER-SHAFT ; ABS 94HB	2
11	14239-101-610	PICK UP ; OPTICAL HEAD SOH 90T4	1
13	15104-503-410	SHAFT-P/U ; SUS 420J2 Ø3	1
16	17008-120-063	SCREW-PH ; +M2 x 6 FE FZB	2
18	14769-057-250	MOTOR-FEED ; RF-310T (SHAFT 10.9)	1
22	13564-601-100	LEAF-SW.; MSW-1731CVC	1

* Parts which are not described in the CD DECK list are not serviceable.
If you need any other parts except those described, apply CD DECK ass'y.

■ EXPLODED VIEW
2.1 MAIN SET (RCD 980)

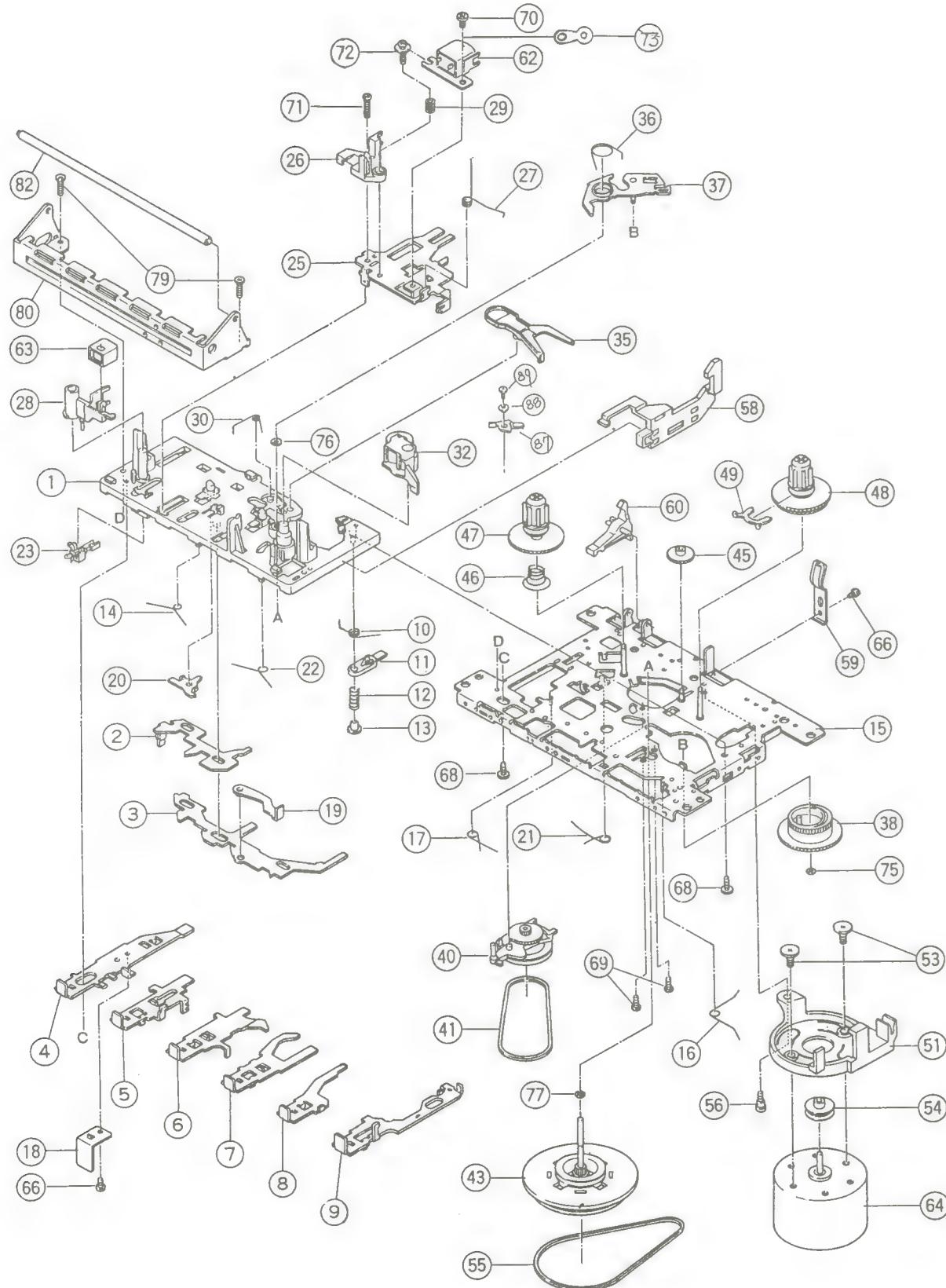


NO.	CODE NO.	DESCRIPTION & SPECITICATON	Q'TY	REMARK	NO.	CODE NO.	DESCRIPTION & SPECITICATON	Q'TY	REMARK
1	14074-0038-00	WINDOW - CASSETTE ; PC 0.5T	1		51	16624-580-810	BRKTAK - ANT ; SPTE 0.3T	1	
3	14102-0002-00	LID - CASSETTE ; ABS BLK	1		53	14030-0002-00	BACK - CABINET ; MIPS BLK	1	
4	14073-0037-00	WINDOW - CD, FUNCTION ; PC 0.5T	1		54	14084-0039-00	KNOB - VR ; ABS BLK	2	
7	12000-0018-00	CABINET - FRONT ; MIPS BLK	1		55	14509-316-050	ROD - ANT ; 5.2PI 728M/M 4S	1	
8	14001-0008-00	GRTLLE - SPK, L ; SPC - 1	1		56	17008-130-105	SCREW - PH ; +M3x10 FE FN	1	
9	14001-0009-00	GRTLLE - SPK, R ; SPC - 1	1		57	14033-0002-00	HANDLE ; ABS BLK	1	
10	14084-0042-00	KNOB - CD, OPEN ; ABS BLK	1		58	16674-531-610	SPRING - BATTERY + ; SWP PI 1.0	1	
11	12724-0038-00	SPRING - PUSH ; SUS 304WPB	1		59	16674-531-730	SPRING - BATTERY - ; SWP PI 1.2	1	
12	12204-0010-00	HOLDER - EJECT ; ABS BLK	1		60	16674-531-810	SPRING - BATTERY + - ; SUS -27	1	
13	15214-506-011	DEMPER - ASSY ; POM	1		61	18114-610-007	LABEL - RATING	1	
14	12724-0037-00	SPRING - DOOR ; SWR	1		62	14103-0003-00	LID - BATTERY ; MIPS BLK	1	
15	14029-114-220	SPK - GENERAL ; D90010CM4Ω 5W	2		63	17448-130-201	SCREW - TAP TITE BH 3x20	9	
16	17458-130-121	SCREW - TAP, TITEBH ; B-3x12 FE FEY	31		64	14074-0039-00	WINDOW - SCALE ; PC 0.5T	9	
17	14084-0038-00	KNOB - DECK ; ABS BLK	6						
22	17159-0016-00	DECK - CASSETTE ; TN21ZSC - 1157	7						
24	13324-0014-00	HOLDER - LED ; ABS BLK	1						
25	14084-0037-00	KNOB - CD ; ABS BLK	1						
26	16033-507-010	CAP - PU ; ABS HF 0660I	1						
27	14929-407-010	DECK - CD ; CMS - V10/A	4						
28	16174-503-410	RUBBER - CD ; SI RUBBER	4						
29	15104-531-720	SHAF - CD ; FE FZY 2.6 x 11.5	4						
30	17158-120-052	SCREW - TAP. BH 2-2x5 FE FZW	1						
31	13323-0012-00	HOLDER - LCD ; ABS BLK	2						
32	11534-0001-00	LEVER - EJECT ; ACCETAL	1						
33	17558-230-101	SCREW - TAB BH SPEC 3x10 FE FZY	1						
34	13564-601-060	LEAF S/W ; MSW - 0080 CNBKP	1						
35	17158-220-103	SCREW TAP BH 2x10 FE FZB	1						
36	16674-538-030	SPRING - CD ; PWR	1						
37	12201-0008-00	CHASSIS - CD ; ABS BLK	1						
38	14042-0005-00	DOOR - CD ; ABS BLK	1						
39	16603-511-830	CHUCK - PLATE ; ABS/GF 20%	1						
40	12203-0009-00	CHASSIS - TUNING ; ABS BLK	1						
41	11474-0004-00	GEAR - TUNING ; ABS NATURAL	1						
42	14084-0040-00	KNOB - TUNING ; ABS BLK	1						
43	11514-0002-00	WHEEL - DRUM ; ACCETAL NATURAL	1						
44	17048-126-051	SCREW - RH ; +M2.6x5 FE FZY	1						
45	14164-0003-00	DIAL - INDICATOR ; PP WHT	1						
46	14084-0041-00	KNOB - LEVER ; ABS BLK	1						
47	16034-506-030	BRKT - P/T ; ABS NATURAL	1						
48	15254-515-710	LINK - RECORD ; PC NATURAL	1						
49	16024-503-710	CHASSIS - RECORD ; ABS NATURAL	1						
50	17558-230-101	SCREW - TAP TITE SPE CO 3x10 FZY	1						

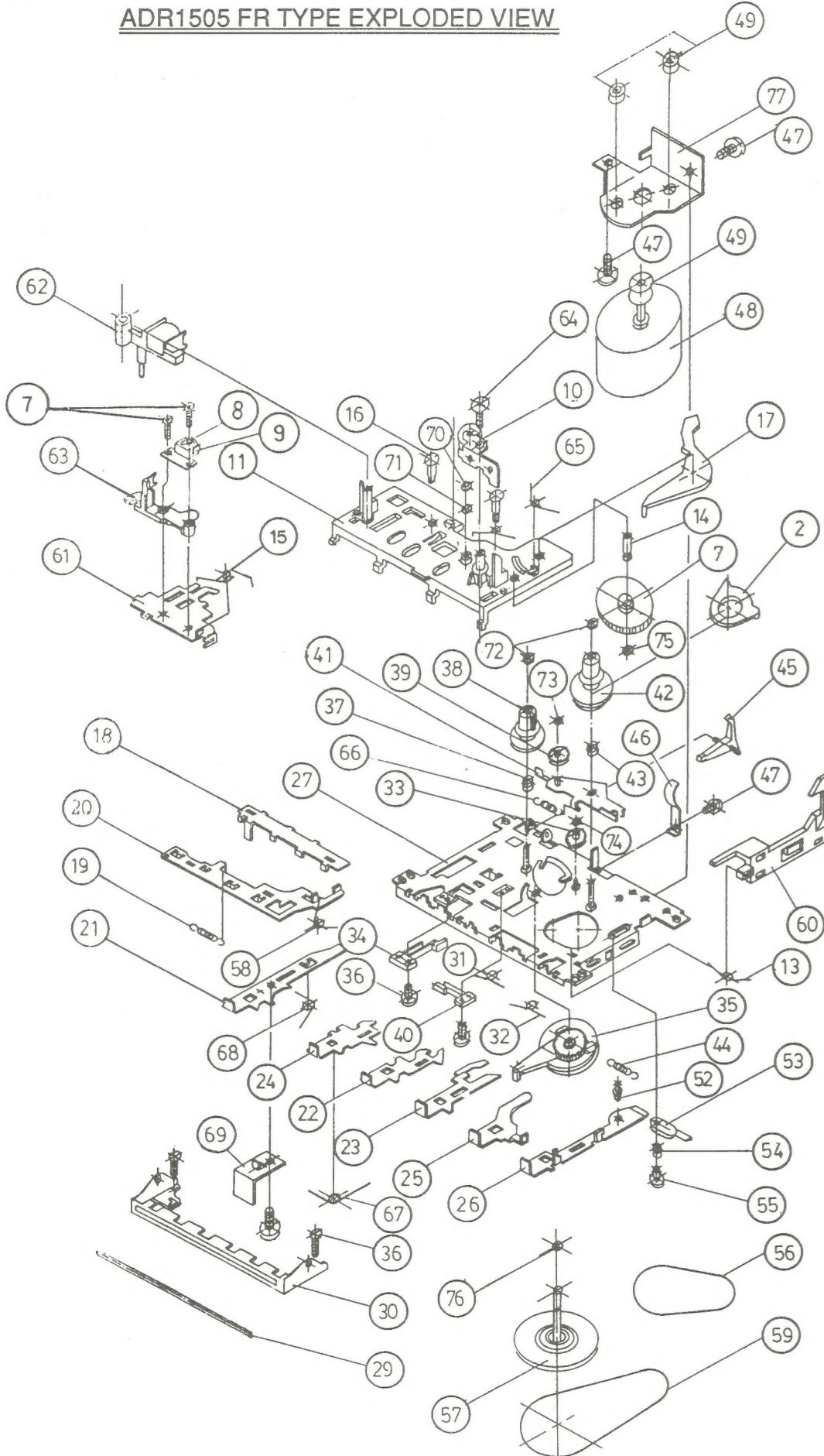
3-1. CASSETTE DECK (TN21ZSC-1157(SC2))

DECK A/S CODE

* DECK ASS'Y : TN21ZSC-1157(SC2) 17159-0016-00



NO.	CODE NO.	DESCRIPTION	SPECIFICATION	Q'TY	REMARK
11	10000-268-011	PAUSE LEVER	1921-14-55	1	
13	10000-268-013	PAUSE STOPPER	1921-14-11	1	
23	10000-268-023	LEAF SWITCH	MSW1541T	1	
28	10000-268-033	MG ARM	1921-03-05	1	
32	10000-268-035	PINCH ROLLER ARM ASS'Y	1921-04-309	1	
35	10000-268-038	SENSING LEVER	1921-26-04A	1	
38	10000-268-047	CAM GEAR	1921-26-02	1	
40	10000-268-042	RF CLUTCH ASS'Y	1921-07-301	1	
41	10000-268-040	RF BELT	1921-07-03	1	
43	10000-268-044	FLYWHEEL ASS'Y	1921-09-303	1	
45	10000-268-049	FF GEAR	1821-10-70	1	
47	10000-268-051	SUPPLY REEL ASS'Y	1921-05-304	1	
48	10000-268-052	TAKE UP REEL ASS'Y	1921-05-303	1	
49	10000-268-053	SENSER	1921-05-06	1	
54	10000-268-054	MOTOR PULLEY	1921-12-01	1	
55	10000-268-055	MAIN BELT	1921-09-04	1	
58	10000-268-062	EJECT SLIDE LEVER	1921-13-02	1	
59	10000-268-064	PACK SPRING	1821-10-93	1	
60	10000-268-069	RECORD SAFETY LEVER	1821-10-69	1	
62	10000-523-008	R/P HEAD	MS15RAA2N1	1	
63	10000-542-002	E HEAD	PHK380-MSI6A	1	
64	10000-502-004	MOTOR	EG530AD9B	1	

ADR1505 FR TYPE EXPLODED VIEW

DECK ASS'Y : ADR1505FR (17159-0023-00)

NO.	CODE NO.	DESCRIPTION	SPECIFICATION	Q'TY
2	10000-607-102	SENSOR REEL	1153-00080AA	1
5	10000-542-002	E-HEAD	PHK380 MSI6A	1
7	10000-607-107	GEAR CAM	11128-00391AA	1
9	10000-523-008	R/P HEAD	MS15R-AA2NI	1
10	10000-607-110	ASS'Y PINCH ARM	ADR15-006	1
17	10000-607-117	ARM SENSOR	11102-00530AA	1
33	10000-607-133	GEAR FF	11128-00080AA	1
34	10000-607-134	SW LEAF (MAIN)	MSW2526GNBKC	1
38	10000-607-138	REEL S ASS'Y	ADR15-001	1
39	10000-607-139	GEAR ROLLER-T	11128-00050AA	1
42	10000-607-142	REEL T ASS'Y	ADR15-002	1
45	10000-607-145	LEVER REC SAFETY	11134-01000AA	1
46	10000-607-146	SP PACK	51299-0250 6XC	1
48	10000-502-004	MOTOR	EG530AD9B	1
49	10000-607-149	PULLEY Y MOTOR	11145-00450AA	1
51	10000-607-151	FLYWHEEL ASS'Y-S	ADR15-003	1
53	10000-607-153	CAM PAUSE LOCK	11116-00010AA	1
55	10000-607-155	CAP	11117-00020AA	1
56	10000-607-156	BELT SUB	34.7 ø x 1.0t	1
59	10000-607-259	BELT MAIN	45.5 ø x 1.0t	1
60	10000-607-160	LEVER EJECT (F)	11134-01220AA	1
62	10000-607-162	ARM MAGNETIC	11102-00520AA	1
63	10000-607-163	BASE HEAD-M	11105-00030AA	1
65	10000-607-165	SP PAUSE SAFETY	51263-02026	1
77	10000-607-177	ARM F.R ASS'Y	ADR15-005	1

PARTS LIST

1. RADIO CASSETTE SECTION

LOCATION NO.	CODE NO.	DESCRIPTION & SPECIFICATION	REMARK
IC101	A4012-0072	IC-LINEAR ; KA2293 DIP FM/AM	
IC201	12119-102-050	IC-EQ ; BA3312N	
IC401	12119-101-290	IC-POWER AMP ; TA8207K	
Q503	12139-301-100	TRANSISTOR ; KSC2328A-Y	
Q501	12149-101-520	TRANSISTOR ; KSA 733-Y	
Q301	12149-301-840	TRANSISTOR ; KSC 900-L	
Q302, 502	12149-301-930	TRANSISTOR ; KSC1008-Y	
Q102	12159-301-330	TRANSISTOR ; KSR2003	
Q401, 451	12159-301-790	TR DIGITAL ; KSR1009	
Q101	12159-301-800	TR DIGITAL ; KSR1007	
D801 ~ 804, 501	12169-201-090	DIODE-RECTIFIER ; IN4002	
D301, 601, 300, 1	12169-301-290	DIODE-SW ; 1SS53/IN4148, CT : 6PF	
ZD501	12169-404-100	DIODE-ZN ; RD6.8FB/UZP6.8B	
D2	12169-501-160	DIODE-AFC ; KS3302	
L2	12539-001-020	COIL-OSC FM ; 7M/M	
L1	12609-132-430	COIL-H, SPRING ; 4T R8P4D CCW CLS N-ADJ	
T301	12619-012-811	COIL-SEVEN CAN ; IR65HH I-BIAS	
T1	12749-202-130	TRANS-IF, AM, A ; 7M/M CAN	
TP1, 2	13124-100-710	TAP-STUD ; 0.5T SPC1 BT2	
VOLUME	11209-804-020	VR-DOUBLE ; RK16K12EO Z01 53B	
TONE	11219-149-010	VR-DOUBLE ; RK 16K 12LO Z01 53A	
C410	11609-154-332	C-ELECTROLYTIC ; SMS 25V 3300M (16 x 31.5)	
J401	13339-101-502	JACK-HEADPHONE ; SHQ9085-01-142 (GRN)	
LD401, 402(OPTION)	12309-115-330	LED ; KLR-124	
MODE, PROGRAM	13559-901-100	SWITCH-TACT ; SKHVBE 029A	
BACK, NEXT	13559-901-100	SWITCH-TACT ; SKHVBE 029A	
PLAY, STOP	13559-901-100	SWITCH-TACT ; SKHVBE 029A	
CF1	14529-301-750	FILTER-CERAMIC ; SFE 10.7MS3G-A	
CF102	14529-315-010	CERAMIC-FILTER ; SFU 455B	
CF102	14529-302-130	CERAMIC-FILTER, AM ; SFU 465B	
BPF	14529-403-010	FILTER-L, C ; PFW-B4 RF-PF TYPE	
CF103	14529-302-920	FILTER CERAMIC ; CDA10.7 MG16-A	
CF104	14539-504-050	CERAMIC-RESONATOR ; CSB 456 F18	
W101	13349-512-565	CONNECTOR-WAFER ; STICK 5267-06A 6P-TYPE	
W601	13349-512-561	CONNECTOR-WAFER ; STICK 5267-02A 2P-TYPE	
W401	13349-527-502	CONNECTOR-WAFER ; STICK 5267-03A 3P	
W201	13349-512-562	CONNECTOR-WAFER ; STICK 5267-04A 4P-TYPE	
W602	13349-512-568	CONNECTOR-WAFER ; STICK 5267-07A 7P-TYPE	
F801, 802	13164-550-010	CLIP-FUSE ; FC51E	
S4	13549-801-370	LEVER SWITCH ; T00630003	OPTIONAL FUNCTION

LOCATION NO.	CODE NO.	DESCRIPTION & SPECIFICATION	REMARK
S2	13519-930-480	SLIDE SW ; 6C-2P 00620144 (NONE-SHORT)	R/P SWITCH
S3	13519-930-160	SWITCH-SLIDE ; 00130101, IC-3P	BEAT CUT/FM MODE
V/SEL	13599-502-020	VOLT SELECT ; PCB 00120353A (354) 110/220V	▲ OPTIONAL
V/SEL	13599-502-050	VOLT SELECT ; PCB 00120 353GI 110-127V/220-240V	▲ OPTIONAL
V/SEL	13599-502-060	VOLTAGE SELECTOR ; PCB 00120353L 120/220V	▲ OPTIONAL
J601	13354-501-310	SOCKET-2P, SW (EP) ; HSC1463-01-0101 (PIN)	▲ OPTIONAL
J601	13354-501-320	SOCKET-2P, SW (CP) ; HSC1466-01-0101 (PIN)	▲ OPTIONAL
P/T	12869-224-010	TRANS POWER EI48 x 18.5 230/240V	▲ VDE
P/T	12869-224-020	TRANS POWER EI48 x 18.5 115/230V	▲ ETC
P/T	12869-224-030	TRANS POWER EI48 x 18.5 120/230V	▲ UL/CSA
Q503		TRANSISTOR ; KSD882-O	

(1) FM/AM OPTIONAL

LOCATION NO.	CODE NO.	DESCRIPTION & SPECIFICATION	REMARK
VARICON	A1115-0021	VARICON-POLY ; P2Z-22BGLT, M-FD	OPTIONAL
VARICON	11819-309-230	VARICON-POLY ; P2Z-22 BGJT-M-FD	OPTIONAL
L102	12513-249-627	COIL-AM ANT ASSY ; P2 8 x 60 570UH	AM ANT COIL
L102	12516-232-566	COIL-ANT ASSY ; 730UH AR8 x 60	AM ANT COIL
T102	12619-058-603	COIL-AM OSC ; 290UH	AM OSC COIL
S1	13549-801-210	SWITCH-LEVER ; 00221013S 2C-2P	BAND SWITCH

(2) FM/MW/LW OPTIONAL

LOCATION NO.	CODE NO.	DESCRIPTION & SPECIFICATION	REMARK
VARICON	11819-309-400	VARICON-POLY ; P2Z-22BPT M-FD 204	
L102, L103	12514-281-576	COIL-FERRITE ANT ; FE-D 285UH/3.0MH	MW/LW ANT
T101	12619-050-703	COIL-SEVEN CAN ; AQ 200 μH FMW	MW OSC COIL
T102	12619-177-902	COIL-SEVEN CAN ; AQ 560 μH FLW BRN	LW OSC COIL
S1	13549-801-310	SWITCH-LEVER ; T0083002 8C-3P A SHORTING	BAND
CT5, 6	11829-512-030	C-TRIMMER ; T203R 20PF	

(3) FM/SW/AM OPTIONAL

LOCATION NO.	CODE NO.	DESCRIPTION & SPECIFICATION	REMARK
VARICON	11819-309-400	VARICON-POLY ; P2Z-22BPT M-FD 204	
L101	12509-805-020	COIL-ANT, SW ; 9.5M/M	SW ANT COIL
L102	12516-203-376	COIL-ANT ASSY ; 280 μH AR8 x 60 MW/SW	AM ANT COIL
T102	12619-050-703	COIL-SEVEN CAN ; AQ 200 μH FMW	AM OSC COIL
T101	12619-173-126	COIL-7 CAN ; 2.73NH AQ FSW GREEN	SW OSC COIL
CT4	11829-512-030	C-TRIMMER ; TZ03R 20PF	

■ CD PACK PARTS LIST

⚠ indicates parts for circuit safe guarding purpose. Therefore, when replacing, be sure to use specified parts only.

LOCATION NO.	CODE NO.	DESCRIPTION & SPECIFICATION	NEW	REMARK
IC0316	12109-303-150	IC-DAC ; KDA0316LD (BULK)		
IC5990	12119-203-770	IC-DS PROCESSOR ; KS5990/KS59910	★	
IC8309	12119-203-780	IC-SS PROCESSOR ; KA8309	★	
IC6296	B4012-0073	IC-LINEAR ; BA6296FP		
IC9201	12119-203-790	IC-RF AMP ; KA9201	★	
IC9270	A4012-0064	IC-AUDIO FILTER ; KA9270	★	
IC7530	12109-303-690	IC-MICOM ; KS56C820-06	★	
Q1701, Q1501	12149-202-050	TRANSISTOR ; KSB564A-Y		
Q2000	12159-301-780	TR-DIGITAL ; KSR1003		
Q1791, 1792	12159-301-800	TR-DIGITAL ; KSR1007		
	12169-301-290	DIODE-SW ; 1SS53/1N4148 CT : 6PF		
	12169-301-290	DIODE-SW ; 1SS53/1N4148 CT : 6PF		
	12429-411-109	COIL-CHOKE ; BAL03ST1ROM		
L1901	12429-411-101	COIL-CHOKE ; LAL02TB 101K, 100UH		
XF1702	14534-504-040	CERAMIC-RESONATOR ; CSA 4.00MG		
XF1701	14539-401-050	X-TAL ; HC18U 16.9344MHz		
VR1701, 1704, 1705	11249-102-044	VR-SEMI TAPE-H ; DVN-DJA A03B24 (20K)		
VR1703	11249-102-064	VR-SEMI TAPE-H ; DVN-DJA A03B24 (50K)		
VR1702	11249-102-104	VR-SEMI TAPE-H ; DVN-DJA A03B23 (2K)		
LCD	12339-104-690	LCD-CD ; LE0636AP		

■ ABBREVIATION LIST

AC	Alternating Current	MHz	MegaHertz
ADJ	ADJustment	MICOM	MIcro COMPUTER
AFC	Automatic Frequency Control	MIN	MINute
ALC	Automatic Level Control	MIX	MIXer
AM	Amplitude Modulation	mm	millimeter
AMP	AMPlifier	MOD	MODulation
ANT	ANTenna	MPX	MultiPleX
ASSY	ASSEMBLY	mV	milli Voltage
		MW	Medium Wave
		mW	milli Watt
B	Base	N	Negative
BH	Bold Head	NFB	Negative FeedBack
BLK	BLack	nm	nano meter
BLU	BLue		
BPF	Band Pass Filter	ORG	ORanGe
BRN	BRowN	OSC	OSCillator
BRKT	BRacKeT	P	Point, Positive
C	Collector, Capacitor	PB	PlayBack
CD	Compact Disc	PCB	Printed Circuit Board
CF	Ceramic Filter	PF	Pico Farad
Ch	Channel	P/T	Power Transformer
cm	centimeter	P/U	Pick Up
CIRC	Cross Interleave Reed solomon Code	Q'TY	QuantiTY
CLV	Constant Linear Velocity	R	Right, Resistor
COL	COLon	RAM	Random Access Memory
COM	COMmon	REC	RECord
CON	CONnector	REG	REGulator
D	Depth	REW	REWind
D/A	Digital to Analog	RF	Radio Frequency
DAC	Digital to Analog Conveter	RH	Round Head
dB	deciBel	ROM	Read Only Memory
DC	Direct Current	R/P	Record/Play
DET	DETector	rpm	revolutions per minute
DEV	DEViation		
DIV	DIVision	sec	second
DSP	Digital Signal Processor	SEL	SElector
E	Emitter	SPK	SPeAKER
E.F	Eight to Fourteen	SSG	Standard Signal Generator
E-HEAD	Erase HEAD	SSP	Servo Signal Processor
EQ	EQualizer	ST	STereo
F.Bias	Focus Bias	SVR	Semi Variable Resistor
F.E	Focus Error	SW	SWitch, Short Wave
FF	Fast Forward	SYNC	SYNChronous
F.FWD	Fast ForWarD	T.E	Tracking Error
Fig	Figure	TP	Test Point
FM	Frequency Modulation	TR	TRansistor
FOK	Focus OK	TRANS	TRANSformer
FREQ	FREQuency	V	Volt
GND	GrouND	VCO	Voltage Controlled Oscillator
H	Height, High	Vpp	Voltage peak to peak
Hz	Hertz	VR	Variable Resistor
IC	Integrated Circuit	VREF	REFerence Voltage
IF	Intermediate Frequency	V/SEL	Voltage SElector
IFT	Intermediate Frequency Transformer	VTVM	Vacuum Tube Volt Meter
I/O	Input/Output	W	Watt, Weight
INTRO	INTROduction	WHT	WHiTe
KHz	KilloHertz	X-TAL	crystal
Kg	Kilogram		
L	Left, Low		
LCD	Liquid Crystal Display		
LED	Light Emitting Diode		
LPF	Low Pass Filter		
LSI	Large Scale Integration		
LW	Long Wave		